DECEMBER 21, 1953

NEWS ISSUE

# Electrical World

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The people of Denver join hands to make it...

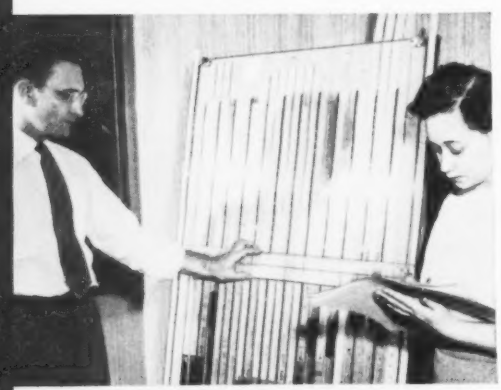
EFFECT OF TRANSMISSION LOSS calculations on AG&E system is discussed by D. K. Blake, Mgr. Transmission Engr. and S. B. Crary, Mgr. Analytical Engr.

# NEW "PENALTY FACTOR COMPUTER" EXPECTED TO SAVE $100,000 PER YEAR ON INTERCONNECTED SYSTEM

## Brings Top System Efficiency by Co-ordinating Transmission Losses with Plant Performance, Fuel Costs

Developed after two and one-half years of research by General Electric working with American Gas & Electric Service Corp., a new "penalty factor computer" will make optimum system operating economy a reality. It permits the load dispatcher to take into account the many constantly and rapidly fluctuating conditions on the lines as well as in the stations.

The electronic computer brings transmission losses into the load scheduling picture, permitting almost instantaneous calculation of the most efficient generation scheduling. Resulting savings of $100,000 per year are expected by A.G.&E.



OPTIMUM SYSTEM ECONOMY will be approached when this incremental fuel cost slide rule at A.G. & E.'s System Production Co-ordinating Group Office in Columbus, Ohio, is teamed with new computer.

### Applicable to Other Systems

The "penalty factor computer" eliminates the current practice of approximating the corrections for adverse effects of transmission losses. It supplements the incremental fuel cost slide rule now used to allocate generation facilities under varying conditions of load and capacity. And it permits the load dispatcher to quickly order changes at far-away generating stations after rapid calculation of line losses.

Although originally developed to obtain top economy on the A.G.&E. system, the new computer will be applicable to other systems.

### Increased Need for Co-ordination

It meets the increasing need for proper co-ordination of incremental fuel costs and transmission losses caused by:

1. Economic factors and availability of fuel, water, etc., that necessitate location of generating plants at greater distances from load centers.
2. Installation of larger blocks of power which often results in necessity of transmitting power out of a given area until load in that area equals newly installed capacity.
3. Interconnection of power systems for purposes of economical interchange and reduction of reserve capacity.

For more details on the new "penalty factor computer," write for GET-2415. General Electric Co., Schenectady 5, N. Y. 301-245

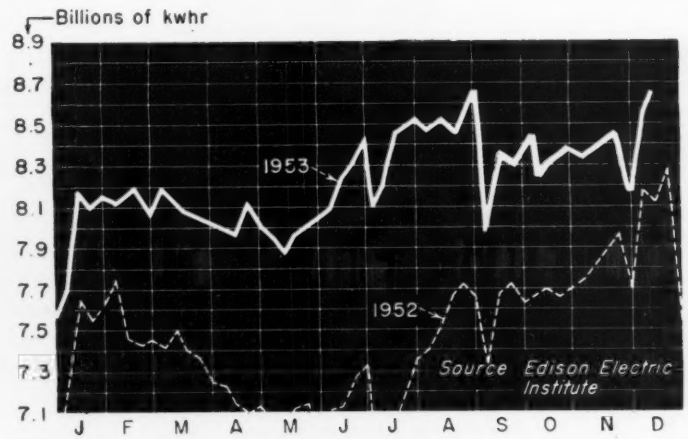
*MORE POWER TO AMERICA*

GENERAL ELECTRIC

VOLUME 140, NO. 25

# December 21, 1953

# Electrical World




## Output Week Ended Dec. 12—8,661,131,000 Kwhr

Per Cent Change From Previous Year

| | Total US | New Eng. | Mid. Atlan. | Cent. Ind. | West Cent. | South-east | South Cent. | Rocky Mount. | Pacific NW | Pacific SW |
|---|---|---|---|---|---|---|---|---|---|---|
| Dec. 12 | +6.4 | +0.4 | +1.1 | +0.0 | +6.7 | +16.5 | +5.1 | +10.1 | +27.2 | +4.9 |
| Dec. 5 | +5.1 | +0.9 | +0.9 | −1.1 | +6.5 | +15.2 | +3.8 | +7.4 | +21.0 | +2.2 |
| Nov. 28 | +5.7 | +3.9 | +2.7 | −1.2 | +4.5 | +17.6 | +1.7 | +6.9 | +21.6 | +0.4 |

## Electric Power Statistics

| | | Latest Month | Preceding Month | Year Ago |
|---|---|---|---|---|
| Peak Load (Million Kw) | Sept. | 77.2 | 77.1 | 69.6 |
| Capacity (Million Kw) | Oct. | 88.62 | 87.59 | 79.70 |
| Production (Billion Kwhr) | Oct. | 37.61 | 37.04 | 34.87 |
| Hydro | Oct. | 7.14 | 7.59 | 7.02 |
| Fuel | Oct. | 30.48 | 29.45 | 27.85 |
| Fuel Consumption | | | | |
| Coal (Million Tons) | Oct. | 10.22 | 9.70 | 9.94 |
| Oil (Million Barrels) | Oct. | 6.78 | 6.16 | 7.16 |
| Gas (Billion Cu Ft) | Oct. | 96.85 | 105.30 | 82.62 |
| Sales (Billion Kwhr) | Sept. | 32.64 | 32.82 | 30.11 |
| Residential | Sept. | 8.55 | 8.48 | 7.66 |
| Commercial | Sept. | 5.90 | 5.98 | 5.37 |
| Industrial | Sept. | 15.67 | 15.83 | 14.75 |
| Other | Sept. | 2.51 | 2.52 | 2.33 |
| Net Income Class A & B Companies ($ Million) | Oct. | 76.23 | 81.17 | 65.94 |
| Estimated Dec. '53 Peak (Million Kw) | Sept. | 85.6 | 86.2 | 88.0 |
| Kwhr per Residential Customer (12 Month Average) | Sept. | 2,303 | 2,289 | 2,131 |
| Revenue per Kwhr Residential Service (12 Month Average) | Sept. | 2.76¢ | 2.76¢ | 2.77¢ |
| Canadian Production (Billion Kwhr) | Sept. | 5.09 | 5.09 | 4.99 |

## Business Statistics

| | | | | |
|---|---|---|---|---|
| FRB Industrial Production Index††† | Oct. | 236 | 236 | 233 |
| Gross National Product Annual Rate ($ Billion) | 3rdQtr. | 369.0 | 372.4 | 345.3 |
| EW 5 Industry Production Index | Oct. | 127.6 | 128.3 | 127.4 |
| ENR Construction Cost Index†† | Nov. | 128.1 | 128.0 | 123.4 |
| BLS Consumer's Price Index | Oct. | 115.4 | 115.2 | 114.2 |
| NEMA Insulation Materials Sales Index† | Oct. | 154 | 153 | 161 |
| NEMA Electric Appliance Sales Index† | Oct. | 91 | 101 | 113 |
| NEMA Household Refrig. Sales Index† | Oct. | 46 | 62 | 62 |

*Preliminary **Revised †1947-49=100 ††1949=100 †††Unadjusted

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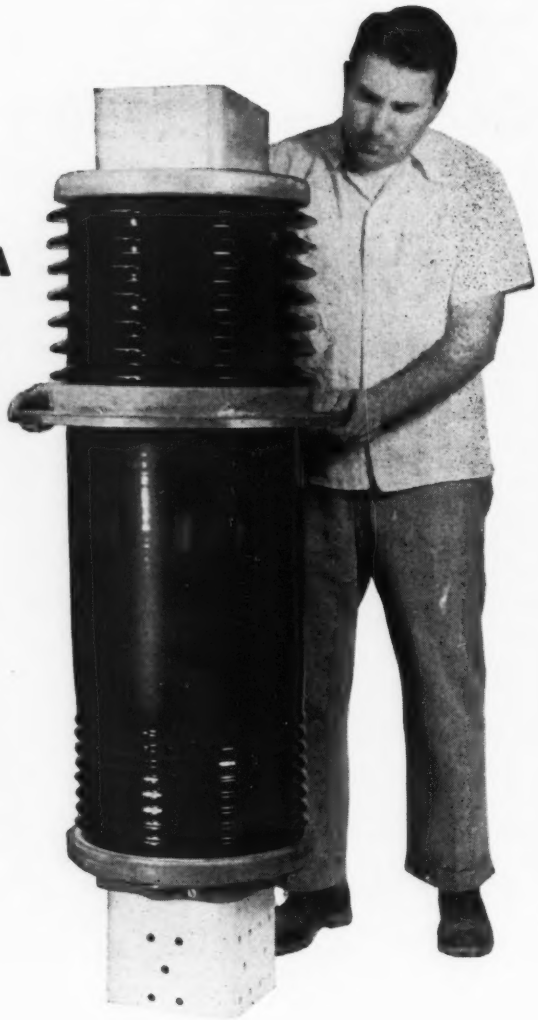
# THIS IS A 7,000-AMP WALL BUSHING



**This** bushing started out at Lapp as a rigid set of performance specifications supplied by our customer . . . an indoor-outdoor wall bushing, rated at 7,000 amperes, 23 Kv, with a copper conductor, 9″ square, 60″ long, silver plated at both ends for contact.

This is a typical "Lapp-type" job. Our design experience assures competence in settling of engineering details, and confidence on the part of our customer in approving design. Our production facilities are of capacity and variety suited to large and complicated special jobs. And finally, design and manufacture can be proved by test.

In this case, a porcelain weighing 257 pounds is incorporated in a bushing of total weight of 746 pounds. Heavy bronze caps are cemented to both porcelain ends, the cap at the upper end brazed to the stud for water-and-air-tightness. The lower end is spring-loaded to maintain assembly snugness under temperature variation. Facilities called on by this piece include . . . production of very large completely reliable porcelain pieces . . . a rather extensive machine shop . . . brazing, welding and plating.

As we said, it's a typical Lapp job, handled with assurance and promptness, and resulting in equipment which goes into service and stays in service without a whisper of trouble. The purchaser feels secure in the knowledge that he has delegated his problem wisely. Incidentally, that's confidence shared by many power companies, in the specification of Lapp insulators for transmission and station use.

Lapp Insulator Co., Inc., Le Roy, N.Y.

**Lapp**

# THE ELECTRICAL WEEK

**The Issue's News Highlights**—Report prepared for Nema shows that imports of electrical goods into U. S. is rising more rapidly than U. S. exports of these goods.

Seattle mayor appoints Raver as City Light superintendent . . . Advocates of three different plans for development of power at Niagara exchange views at Rochester meeting.

**Edison Electric Institute's** board of directors unanimously approved the idea of a utility-supported Diamond Jubilee show with a format similar to last year's Ford anniversary show. Leland Hayward, who produced the Ford program, has expressed interest in doing one for the utilities. Financing—$850,000 to $900,000 for a two-hour telecast over three networks—still remains the big problem.

**J. Frank Ward,** City Light superintendent at Tacoma, Wash., since 1947, was appointed first managing director of Washington State Power Commission. The agency, authorized by the 1953 state legislature, was organized recently with Walter S. Gordon as chairman.

**Gov Thomas E. Dewey of New York** was charged with political expediency in the Niagara issue by William A. Lyons, New York State E&G vice president. At a Region 2 PUAA meeting he said: "The governor is opposing us not because he believes in public power, but because he believes it is the political thing to do. If this feeling is conveyed to the national administration, we've just got one helluva fight. If we don't get the five-company bill out of the Senate this year, with the election coming up next fall, it may be years until private enterprise gets to build the Niagara project."

**Ventures Ltd of Canada** intends to build a billion-dollar, 4.5 million-hp power project near Atlin Lake in the Yukon. The hydro plant, on which preliminary work will begin next year, would supply a large mining and industrial site on the Taku River just east of the Alaska-British Columbia border.

**Mayors of eight Southern communities** in the Tennessee Valley area agreed President Eisenhower was not out to sell TVA to private interests. But, asserting "some Republicans have the axe out for us," the mayors promised the biggest fight since the Civil War if the federal government tries to dispose of the valley project.

**Florida Power Corp** racked up a 509-14 vote in a 30-year franchise election in High Springs, Fla. . . . Its subsidiary, Georgia P&L, received 30-year franchises from Lakeland and Folkston, Ga.

**Columbia-Snake River Public Power System,** organized this year by six PUD's in southern Washington State to obtain additional hydro power, should be extended to include all PUD's and municipal power systems in the state, the Washington PUD Association recommended at its annual meeting.

**Off the Washington Wire . . .** The Army awarded a $3,651,000 contract for two 73,684 kva generators for McNary Dam on the Columbia River to English Electric Export & Trading Co, which bid lower than four American competitors. The bid was less than 25% below the nearest domestic bid, that of General Electric, but Army Secretary Stevens ruled the "Buy American" discretionary regulation should be disregarded in this case.

Newly formed Energy Accumulation and Exchange Corp of New York City has filed a declaration of intention to build a huge pumped-storage power project in Chautauqua County, N. Y. Plan calls for pumping Lake Erie water into a man-made reservoir during off-peak hours, and releasing it through five special turbine-pumps for generation of peak power. Proposed $60 million project would have an output of 400,000 kv.

Interior Department is recommending authorization of the $1.1 billion initial phase of the Upper Colorado River development plan. This includes three large storage dams and 13 irrigation projects.

U. S. Court of Appeals will hear arguments Dec. 23 contesting the federal license granted New York State Power Authority for the St. Lawrence Power Project. Briefs are in.

New York's Governor Dewey recently discussed Niagara power development with President Eisenhower and members of the White House staff.

**Sen Warren G. Magnuson** (D-Wash.) said that unless the Eisenhower Administration takes some concrete action soon on building new hydro projects in the Pacific Northwest, the Democrats will have a major issue on which they expect a large degree of popular support. He charged flatly that the Administration now has no intention of beginning any dams.

**California-Oregon Power Co** received approval from California and Oregon PUCs to raise rates $2.1 million annually . . . Coast Counties GE& will be permitted to raise its rates $200,500 a year, effective Jan. 1.

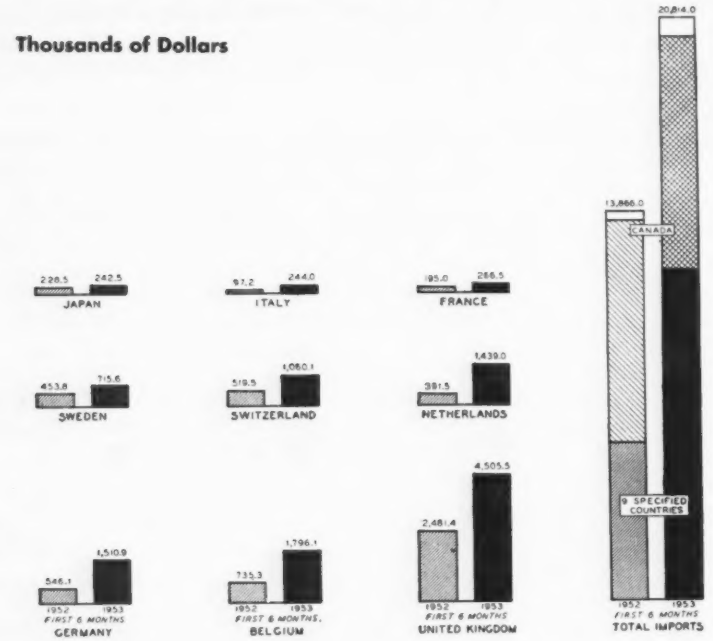
**Shawinigan W&P Montreal,** plans to spend about $60 million for construction in the five-year period 1953-1957.

**Executive Changes . . .** John W. Sheehey, vice president of Green Mountain Power Corp, Montpelier, Vt., was elected president to succeed Ralph N. Hill, who continues as chairman of the board . . . Lee H. Poe, Southern Division manager for Arizona Public Service, was promoted to vice president of the utility . . . American G&E Service Corp's new commercial vice president is Paul D. Brooks, formerly associated with Ebasco Services, Inc . . . R. N. Benjamin, vice president of Stone & Webster Service Corp, was named president to replace George H. Clifford, who was appointed chairman of the board.

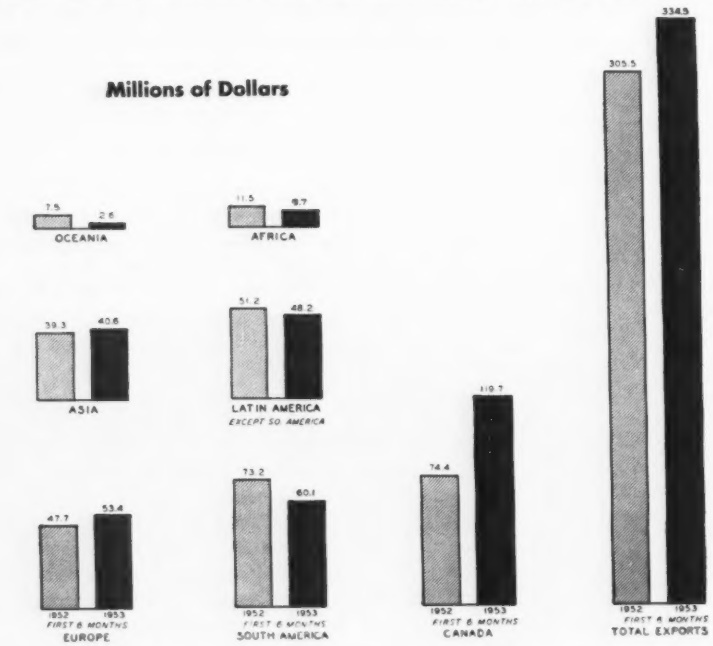
# Electrical Imports Show Rapid Rise . . .

## . . . in recent years, report prepared for Nema reveals. Survey also shows smaller export gains

### U.S. Imports of Electrical Machinery and Apparatus




### U.S. Exports of Electrical Machinery and Apparatus




Detailed report prepared for National Electrical Manufacturers Association shows that imports of electrical machinery and equipment into this country is rising at a more rapid rate than exports of the same goods by U. S.

Imports of electrical equipment into this country were eleven times higher in 1952 than they were during the period 1935-39, while U. S. exports were only five times higher, the survey revealed.

**Made by Research Group . . .** The report was made for Nema by the National Industrial Conference Board, New York business research organization. The report was made public Dec. 9 at a press conference in New York.

Another section of the report, prepared by Stone & Webster Engineering Corp, concluded that extensive use of foreign-made power equipment in the nation could have a serious adverse effect on power supply during disaster situations like floods or hurricanes. Impairment of power supply, the report said, would arise from substantial delays and expense in overhauling and replacement of imported equipment.

The conference board report states that the rise of foreign electrical sales in this country in the first six months of this year was particularly sharp, running 50% ahead of 1952. In the same period, U. S. sales abroad rose only 9%, and actually declined if sales to Canada were excluded.

**Contributing Factors . . .** The survey lists five main factors contributing to the increasing foreign competition in the U. S. and in overseas export markets. These are:

**1.** Increase in European industrial production to levels one-third or more higher than in 1938.

**2.** Foreign wage rates and wage supplements one-tenth to one-third higher than those in U. S.

**3.** Longer work week in Europe (44-48 hours) than in U. S. and smaller overtime pay (25% premium

**U. S. Exports and Imports, and Total Sales of Electric Goods**

**(Millions of Dollars)**

| | Total Sales | U. S. Domestic Exports | U. S. Imports for Consumption |
|---|---|---|---|
| 1935-39 (1).. | 1,582 | 97.9 | 2.3 |
| 1946-50 (1).. | 8,369 | 445.2 | 5.3 |
| 1951 ..... | 12,170 | 536.6 | 18.8 |
| 1952 ..... | 13,740 | 616.4 | 27.4 |
| 1953 ..... | 16,098 (2) | 334.5 (3) | 20.8 (3) |

(1) Average
(2) Forecast
(3) Figure is for first six months of 1953
Source: Bureau of Census

pay in Europe compared with 50% in U. S.).

**4.** European export subsidies and special "dollar drives" to stimulate exports particularly to U. S.

**5.** Lower tax burdens on foreign competitors selling in their own, U. S. and third country markets.

In addition the report asserted that postwar European exchange controls and various other restraints on trade discriminate against the U. S. compared with non-dollar areas.

**Service Called Undependable . . .** The Stone & Webster report declared that "experience with equipment and service provided by foreign manufacturers, particularly in time of stress such as war, indicates that they cannot be depended upon to deliver essential equipment as needed nor to service that equipment after it is installed. Because of differences in basic design, manufacturing practices and specifications, it would be difficult for U. S. manufacturers to repair or service such equipment."

The engineering survey contended that "it is the generally accepted opinion of engineers in the United States that foreign manufacturers equipment does not have the capacity or reliability of equipment furnished by U. S. manufacturers." In support of this claim the report cited eight major cases of unsatisfactory experiences with foreign-built electrical equipment in Latin American countries during World War II when ordered equipment was not delivered or could not be serviced by the supplying countries.

Both the conference board and Stone & Webster reports were prepared for presentation to President Eisenhower's Commission on Foreign Economic Policy and for the information of Nema members.

# Marketing Criteria Eased . . .

## . . . for electric cooperatives purchasing power from federal projects in Missouri River Basin

Federal power marketing requirements have been eased for rural electric cooperatives and other preference customers purchasing power from new government projects in the Missouri River Basin.

Relaxation of the criteria, established in mid-September, will permit preference customers to obtain available federally produced power when and as they need it. This is to be done by making short-term, power sales contracts with non-preference customers so power may be withdrawn to satisfy preference needs.

**Follows Hearing . . .** This concession was made by Department of Interior close on the heels of a four-day hearing by a Senate subcommittee investigating federal power policy (EW, Dec. 14, p 122). Administration officials contend modification had been in the works for weeks and was not the direct result of the Senate hearing.

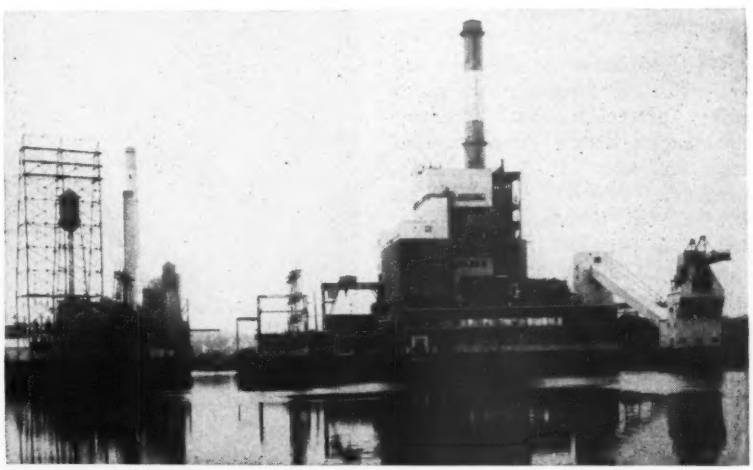
However, much of the testimony and argument at the hearing had centered on this phase of the marketing criteria. Co-op spokesmen argued the criteria would work a hardship on their operations by forcing them either to turn to non-federal sources of power or reserve and pay for blocks of federal power in excess of existing needs.

Previous Democratic Administrations had met the problem by writing a three-year "withdrawal clause" in sales contracts for non-preference customers, such as electric companies. As preference needs grew, the withdrawal clauses permitted Bureau of Reclamation to take the power from companies in order to serve co-ops and other preference customers.

**In Line with Policy . . .** The Republican Administration, in line with its power policy statement of Aug. 18 (EW, Aug. 24, p. 102), sought to cast aside the "withdrawal clause" in favor of long-term contracts to all customers. Section 5 of its Missouri River Basin criteria (EW, Oct. 12, p 8) stated:

"No provisions will be made in the terms and conditions of sale which will result in automatic increases in the initial power commitment without a proper compensation for the increased power reserved."

But in easing the criteria, Interior



# Far Rockaway Plant Put in Service

Long Island Lighting Co started operations at its new, $19-million Far Rockaway Plant earlier this month. The plant, under construction during the past year and a half, adds another 100,000 kw to the system.

said, "If at the conclusion of such [contract] negotiations, there appears to be any power immediately available which will not be needed until a later time by the preference customers, it will be reserved for them as a class by selling it under short-term interim contracts by which it can be recaptured for the preference customers at the termination of such contracts."

The Jan. 1 deadline for receiving application for new blocks of federal power in the Missouri Basin was also modified. Under the clarification, the deadline will be merely for the purpose of getting estimates of preference customer requirements "so that some plans can be made for the disposal of the energy."

Assistant Interior Secretary Fred G. Aandahl, Undersecretary Ralph Tudor, Solicitor Clarence Davis and Assistant Reclamation Commissioner Harvey E. McPhail sat through four successive days of hearings by the Senate Judiciary Subcommittee on Anti-Trust and Monopoly Legislation. They were questioned by senators and co-op spokesmen. William C. Wise, former deputy administrator of Rural Electrification Administration, conducted much of the questioning for Missouri Basin co-ops.

**Preference Debated . . .** During the course of the hearing, Wise contended that the marketing criteria violated the preference clause. He said such a major policy change at a time when Congress is not in session was inappropriate because it cannot be properly reviewed by Congressional committee.

Co-op witnesses charged time and again that the Interior power policy closely paralleled electric company thinking on federal power development and sales. H. Vance Austin, manager, Colorado Association of REA Co-ops, introduced a comparison which purported to show that a speech by Assistant Interior Secretary Aandahl had its counterpart in "power company propaganda."

Austin also recited statistics and membership of Electric Companies Advertising Program, Public Information Program, National Tax Equality Association, Edison Electric Institute and National Association of Electric Companies. All these are joined together, he charged, to fight public power. Money for their programs comes out of the pockets of the electricity consumers, he added.

# Public Power Groups Rallying

## Conference of electric consumers, meeting in Denver, makes plans for federation to get their message to the people

Creation of a permanent organization to serve as a sounding board for all groups advocating public power development was presaged in Denver this month. In a "statement of principles and position," a hurriedly called conference of power consumers urged that a forthcoming Electric Consumers Conference "complete an effective federation of all our groups to assure nationwide unity of action on each front." This second ECC (EW, June 9, '52, p 9) has been scheduled in Washington, D. C for "not later than early in March."

The two-day Denver meeting, billed as a "National Electric Consumers Conference" and called by the National Farmers Union, attracted almost 700 delegates from 30 states, representing 88 farm, labor, and regional and state cooperative associations, and 130 local cooperatives. They heard public power spokesmen from all corners of the land let loose their verbal heavy artillery at the Interior Department's new federal power policy and spray plenty of small arms fire at the private utility industry.

SEN WILLIAM LANGER
"Co-ops will win the fight"

**Leading Figures . . .** Among those triggering the bombardment were Senators William Langer (R-N. D.) and Robert S. Kerr (D-Okla.); Clyde T. Ellis, executive manager, National Rural Electric Cooperative Association; Alex Radin, executive manager, American Public Power Association; Leland Olds, former chairman, Federal Power Commission; A. O. Knight, vice president, Congress of Industrial Organizations; States R. Finley, chairman, Electric Power Board of Chattanooga; C. Girard Davidson, chief counsel, National Hells Canyon Association; James Patton, president, National Farmers Union; and Robert Donovan, president, Northeastern Association of Electric Cooperatives.

Collectively, they and others on the program charged that private utilities had "captured" the Republican Administration, and are bent on destroying public power, increasing electric rates, and stealing the nation's hydro resources. Individually, they pictured the Interior Department as a "wrecking crew" and "stooges of the power lobby," and private utilities as "blind and greedy forces" and "a distinctly anti-social element."

**Policy Statement . . .** The views of the delegates were summarized in the four-part, 1,800-word statement of principles, which, among other things, condemned:

- "The Interior Department's power policy."
- "Violation of the federal preference clause by long-term contracts with private utilities without withdrawal provisions . . ."
- "Cutback of REA loan programs and crippling of its technical assistance programs."
- "Federal withdrawal of opposition to the licensing of private power dams at Hells Canyon. . ."
- "The proposed giveaway of Niagara Falls to five power companies."

## German Toy Mart Illuminated Again

For the first time since World War II, colorful Christmas lights brighten Koenig Street in Nuremberg, Germany. Nuremberg is famous for its Christmas toy market.

• "Shameful repudiation of legal contracts between Southwest Power Administration and G&T co-ops."

Its chief recommendations were:

• "The next session of Congress should approve funds for the construction of projects, chosen from along those already authorized or planned so as to meet the power needs of all areas of the nation and assure abundant energy for national defense and full employment."

• "Federal legislation to make it illegal for any electric or other utility engaged in interstate commerce and enjoying guaranteed profits without economic risk while operating as a private monopoly under franchise privileges granted by the public, to finance or engage, either directly or indirectly, in any activity designed to influence political action at either local, state or national levels of government, or to create public opinion for or against any such actions."

**Other Resolution . . .** The conference also adopted a resolution asking the Senate Judiciary Subcommittee on Anti-Trust and Monopoly Legislation headed by Senator Langer, to urge the legislation proposed in the latter recommendation.

Langer was a key speaker at the meeting, bringing it to a close with a ringing declaration: "You folks are going to win this fight."

He pictured the fight as one for the very survival of REA, "much greater in extent than you anticipate."

He urged his listeners to remind Congressmen of the voting power they represent. "If they back you in this fight," he said, "be sure and back them. Otherwise, kick them out."

He viewed Interior personnel as the President's hired men, "and he can fire any of them overnight."

"When Dwight Eisenhower understands this problem, he's going to ask Interior Secretary McKay what goes on," he said. "Then Congress will have its opportunity."

**First Victory . . .** Conference officials were quick to point to the meeting as one of the precipitating reasons for the change in the Missouri Basin power marketing criteria (see page 7).

They emphasized, despite a statement by Assistant Interior Secretary Fred Aandahl that the move was in the making for some time, that the conference, called only three weeks before Interior made its changes, helped force the Department's hand.

## Raver Quitting BPA

### Mayor nominates Bonneville administrator as Seattle City Light superintendent

Paul J. Raver has been appointed City Light superintendent at Seattle, Wash., to succeed E. R. Hoffman. The mayor's appointment is subject to confirmation by the City Council but a majority already has pledged confirmation.

Council approval is expected today (Dec. 21) after which Raver will submit his resignation as Bonneville Power administrator to Douglas McKay, Secretary of Interior. Hoffman had asked for retirement Jan. 1 but has agreed to continue in office until Jan. 15, giving Raver time to close up pending Bonneville business.

**BPA Chief since '39 . . .** Raver had served as Bonneville administrator since 1939. Born in Indiana, Raver received a civil engineering degree from the University of Nebraska in 1917, a business administration degree from Northwestern University in 1927, and a doctor's degree of philosophy from Northwestern in 1933.

Raver became an instructor in public utilities at Northwestern University in 1927, rising to full professor and taking charge of all public utility research and courses. He served as chairman of the Illinois Commerce Commission and was a member of the Illinois State Rural Electrification Committee.

**Four-Year Term . . .** Raver's appointment is for a four-year term but reappointment has become traditional at Seattle.

Raver, in accepting the nomination, declared "all my energies have been devoted to development of low cost power for expansion of Pacific Northwest agriculture and industrial payrolls. Abundant low cost kilowatts have demonstrated they can build this region into one of the great industrial payroll centers of the world."

Most mentioned successor to Raver as BPA administrator is Dr William A. Pearl, director of industrial research of the Institute of Technology at Washington State College, Pullman, Wash. Interior may designate someone within BPA as acting administrator before choosing a permanent successor to Raver.

# IN THE INDUSTRY

## AEC Waits, Industry Waits, Congress Waits

If the private utilities don't get a law the next session of Congress that would permit them to own, develop and operate nuclear-fueled power plants, it will probably be for one reason: the lawmakers do not feel the issue is urgent enough.

They're pretty sure to think private industry feels the same way if Feb. 15 passes without definite action on industry's part to take advantage of an offer Atomic Energy Commission has made as a first step toward letting private firms get into the atomic energy act. That was the tentative deadline AEC set for receiving offers from industry to join with the government in building the country's first full-scale commercial power reactor.

A study made earlier this year by AEC Commissioner Thomas E. Murray indicated there was no immediate chance of industry building a utility-sized atomic power plant even if the present McMahon Act were changed to permit it.

Upon the results of this study, AEC decided to go ahead in developing the first commercial reactor plant with government funds. This was announced in late October (EW, Nov. 2, p 74). In making the announcement, Murray specifically invited private investment in the conventional portions of the plant and in its operation.

When industry failed to come forward to participate in the Commission-sponsored project, the agency again made a formal invitation for private investment and industry participation (EW, Dec. 14, p 118). At that time it set the February deadline and sat back and waited. To date no attractive firm offer for large-scale industrial participation has been received. AEC had hoped its invitation might bring investment of risk capital that could lead to future profits for the private participants.

Maybe the President's speech before the United Nations suggesting the pooling of fissionable material for peaceful purposes has raised a doubt in the minds of would-be participants. But Rep Sterling W. Cole (R-N. Y.) chairman of the Joint Committee on Atomic Energy, said last week that whatever Congress may do about the President's plan, he would introduce a bill at the opening of the next session to make possible private development of the atom in this country.

Cole said he did not see any conflict between legislation the President might ask to implement his plan and the private development bill he intends to offer.

But lawmakers who would vote for changes in the Atomic Energy Act would like to see some concrete proposals from industry to show that revision of the act is not only necessary but immediately necessary. Conversely, those who would make these proposals appear to be waiting for Congress to act.

Revision of the Act is now on the President's legislative "must" list. But this impressive and sometimes ill-respected list is sure to dwindle as Congressmen, with an eye to the fall campaign for reelection, drive for an early adjournment. And opponents of changes in the act will not be averse to pointing out that the legislation is controversial, a nasty word in an election year.

Other complicating factors will crop up. Sometime in January, for instance, the AEC probably will announce a five-year program for research and development of power reactors. Electric utilities may want to wait to see if some part of that program might be more attractive than is the AEC offer connected with its Pressurized Water Reactor (PWR) which will power the first full-scale nuclear plant.

But promises of participation in some future program will not make up for lack of participation in the present project—at least if changes in the law are to be made next year.

Until these changes are made, private industry is prohibited from owning any plant which will produce fissionable material or enough nuclear fuel to fire a utility-size plant.

While there seems to be little potent opposition to amending the law, there is a corresponding lack of broad, enthusiastic support for change. There is room to believe Congress would be better disposed to changes in the act if presented with concrete evidence of the utilities' willingness to risk their own capital on an atomic power plant.

# TECHNICAL NOTES

ARCHER E. KNOWLTON

**Prolonged testing** at ac voltages far below the intrinsic short-time dielectric strength of mica insulation produces an observable reduction in dielectric strength.

**Hydraulic couplings** on boiler feed pump drives permit the motor to start and accelerate practically unloaded; pump speed and acceleration are controlled through the coupling.

**Time delay** of 50 to 60 cycles has been advocated for transfer of station auxiliaries from one source to another. Less delay results in high inrush currents while anything like 10 or 12 seconds would interfere with overall operation of the plant.

**Magnesium ribbon anode** drawn into spare duct protected an adjoining-duct cable sheath from corrosion but the ribbon had a relatively short life.

**Flashover** will certainly do some damage to bare conductors because no protective scheme is fast enough to prevent it. Burndowns of covered conductors occur in a very small percentage of the instances of momentary contact.

**Voltage surges** greater than 800 kv at 230 kv transformer terminals where there are 20-35 thunderstorm days per year average once every 10 years. Frequency of 400 kv at 115 kv terminals is once every 2 years.

**Mechanical ash collector** of 75% efficiency in series with an electrostatic precipitator of 96% efficiency should result in an overall collecting efficiency of 97%.

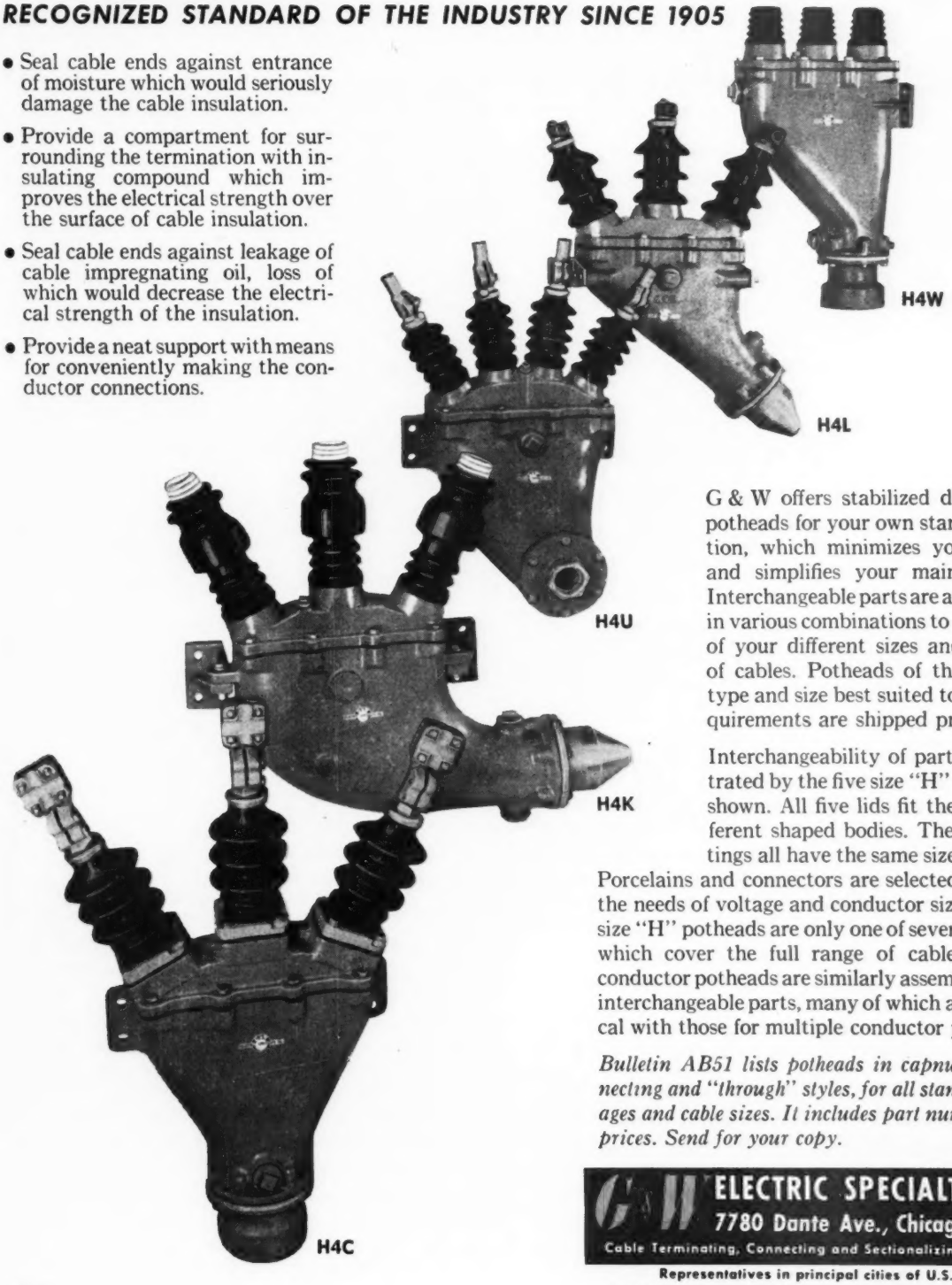
**Telemetering or load control channels** can be derived (with same selectivity against adjacent channels) in the same band width that fewer relaying channels would occupy.

**Synchronous condensers** ordinarily can absorb half as many kilovars when under-excited as they can produce when over-excited.

# G & W Potheads

***RECOGNIZED STANDARD OF THE INDUSTRY SINCE 1905***

- Seal cable ends against entrance of moisture which would seriously damage the cable insulation.
- Provide a compartment for surrounding the termination with insulating compound which improves the electrical strength over the surface of cable insulation.
- Seal cable ends against leakage of cable impregnating oil, loss of which would decrease the electrical strength of the insulation.
- Provide a neat support with means for conveniently making the conductor connections.




G & W offers stabilized designs of potheads for your own standardization, which minimizes your stock and simplifies your maintenance. Interchangeable parts are assembled in various combinations to take care of your different sizes and ratings of cables. Potheads of the correct type and size best suited to your requirements are shipped promptly.

Interchangeability of parts is illustrated by the five size "H" potheads shown. All five lids fit the five different shaped bodies. The base fittings all have the same size 4 flange. Porcelains and connectors are selected to meet the needs of voltage and conductor sizes. These size "H" potheads are only one of several groups which cover the full range of cables. Single conductor potheads are similarly assembled with interchangeable parts, many of which are identical with those for multiple conductor potheads.

*Bulletin AB51 lists potheads in capnut, disconnecting and "through" styles, for all standard voltages and cable sizes. It includes part numbers and prices. Send for your copy.*

**G & W ELECTRIC SPECIALTY CO.**
**7780 Dante Ave., Chicago 19, Ill.**
Cable Terminating, Connecting and Sectionalizing Devices

Representatives in principal cities of U.S.A.
In Canada—Powerlite Devices Ltd., Toronto and Montreal

A534

# Concentric winding as applied to High Voltage Transformer Design and Manufacture

**By C. M. Lovell**
**Vice President and**
**Chief Engineer**
**Moloney Electric Co.**

Practically every transformer built by Moloney has used the concentric type core winding. The substantial success of the Moloney Electric Company has been established by it. This applies over the entire range of sizes and voltage classes.

For voltage classes 69 Kv and below, the concentric layer type of winding has been used with marked success, in past years. For voltage classes up to and including 230 Kv, 60,000 Kva, concentric type with disc or pancake coils for the high voltage windings have successfully been used. This type of construction has very good performance characteristics, but with the larger sizes and higher voltage classes being specified today, physical size has become a critical factor because of existing clearance limitations imposed by all transportation routes.

We, here at Moloney, when confronted with the necessity of building larger sizes and in higher voltage classes, concluded logically that we could still build a concentric type transformer, by using the concentric layer type of winding for these high voltages. In accomplishing this we have retained the favorable operating characteristics of this type of construction, while at the same time reducing overall size. Thus we have been able to increase Kv and Kva ratings greatly while still remaining well within the physical limitations existing transportation facilities imposed upon us.

As its name implies, the concentric layer type of winding is a winding of several layers positioned outside of the low voltage winding, or the low voltage and tertiary windings (Fig. 1).

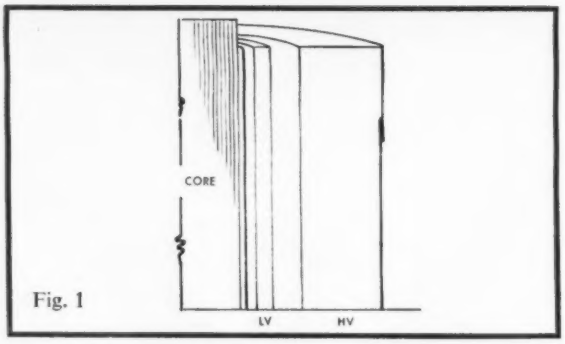



Fig. 1

The first layer is wound directly on a paper cylinder. This cylinder is solid in the space occupied by the conductors and is untreated at the ends.

The conductor consists of several strands of enameled rectangular copper wire. These are transposed continuously by a special machine, and the finished conductor has the strength of a solid wire the same area as the several strands (Fig. 2). This conductor is covered with paper by this same machine, the number and thickness of the paper depends on the voltage which is being applied to the conductor.

Because of the size and weight involved, a special winding lathe is used to wind the concentric layer coils. This machine is specially designed to wind the coil tightly, in both the axial and radial directions. As the conductor is wound on

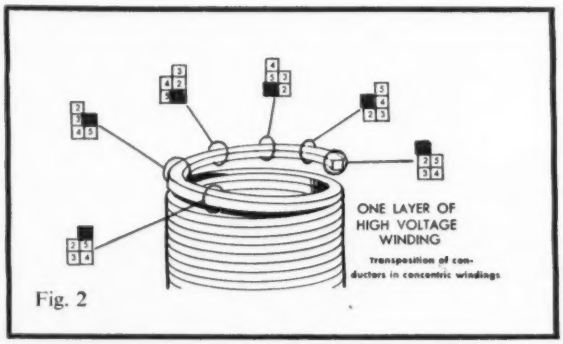


Fig. 2

the paper tube it is pressed down and against the preceding turn by a clamp which travels along the tube.

After the first layer is finished, axial spacer strips which form an oil duct are placed over the layer. Then, many layers of thin paper are applied to form an untreated tube of the size desired. To minimize shrinking in the drying process, tight application of the paper laminations is necessary.

Several layers are thus wound, the number being determined by the voltage of the winding. Each tube has an extension beyond the winding space of the layer. Each layer is also shorter than the preceding one. This stepping back of the winding space is determined by the voltage class and the number of layers. A smooth voltage distribution is obtained in this way.

Over the last or outside layer is wound a paper tube and oil ducts, and finally a shield is built over this tube (Fig. 3). This shield is connected to the line turn and has the effect of producing a nearly uniform impulse voltage distribution.

On completion of the winding the tubes extending beyond the wire space are flanged outward as shown.

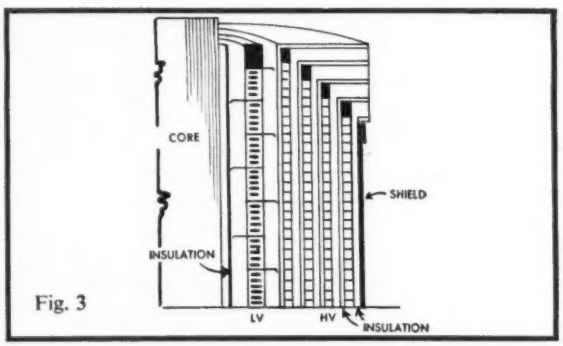


Fig. 3

The concentric layer winding is applied to grounded neutral classes of transformers. The neutral is in the layer next to the low voltage winding. Thus a much smaller space between the low voltage coil and the first layer of the high voltage can be used. This makes for low reactance inherently.

Since the windings of the concentric type of transformer are axially balanced, the stress under short circuit is negligible in the vertical direction. The stress is practically all in a radial direction and since the windings are already circular and well braced, no displacement can occur. This type of winding has been tested under the most severe short circuit conditions with no damage (Fig. 4).

ME53-47

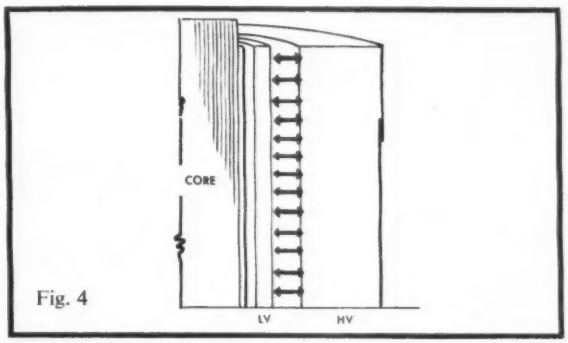


Fig. 4

The optimum impulse voltage distribution curve would be a straight line. The concentric layer winding with its shield will give almost the theoretical distribution curve. Small cusps will appear at each layer end and these require additional insulation which is easily applied on the transposed conductor (Fig. 5).

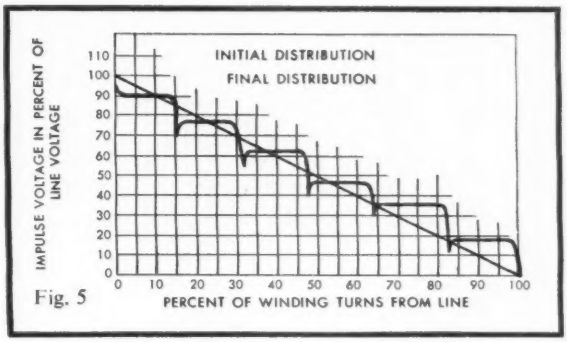


Fig. 5

Many large transformers are now supplied with forced-oil cooling. The concentric layer winding lends itself admirably to this method of cooling. The ducts next to the winding are all vertical and it is quite simple to distribute properly the oil flow to all windings and the core (Fig. 6).

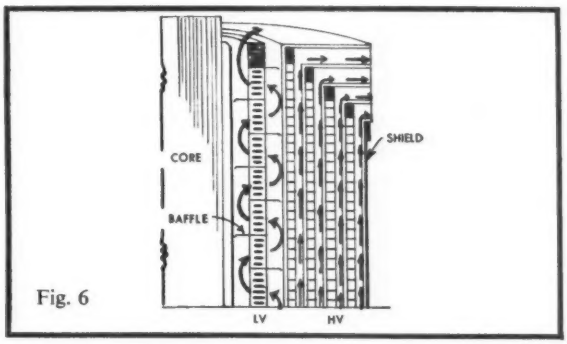


Fig. 6

Because of the smaller space between windings, the coils can be shorter, have a greater radial build and still obtain the required reactance. Savings in critical winding space reflect favorably in the overall size, weight and oil required. It permits construction of the largest transformers and it is possible to ship them in their own one piece tanks. This favorable size and weight factor, makes assembly at the site much easier.

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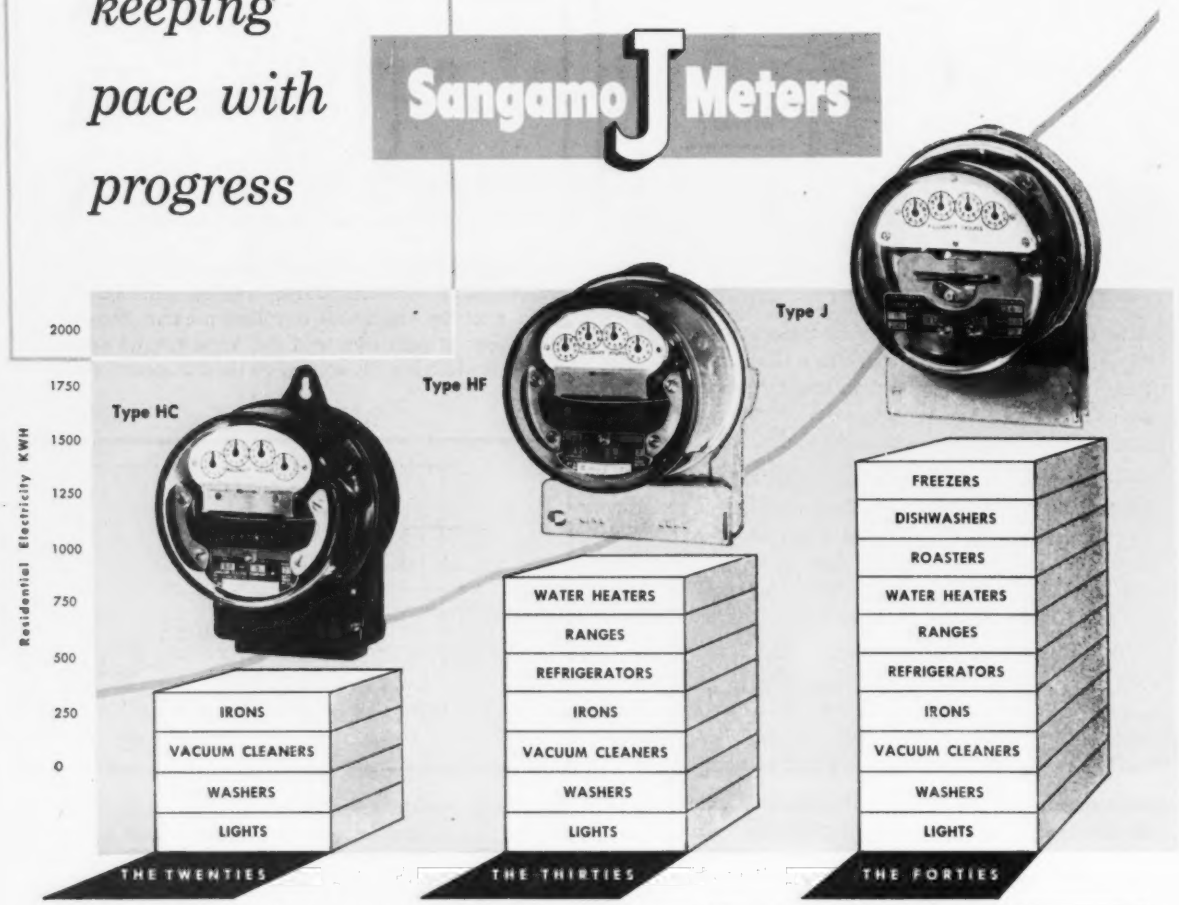
## Sangamo J Meters




In the 1920's, the concept of a full-use customer was one with lights, an iron, and a vacuum cleaner. Today, the full-use customer has a range, water heater and many other major appliances.

Through these years, Sangamo Meters have been adequately measuring these growing loads. Since 1940, the Type J has provided completely accurate measurement of large domestic loads as well as the loads of the small-use customer.

J Meters have met all requirements of the customer, the utility company and the meter superintendent. They have measured with great accuracy—have required little maintenance—and they have been easy to test and to repair.

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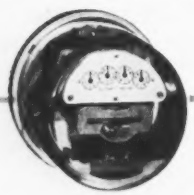
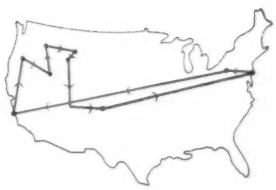


*Only Measured Facts are Known Facts*

*Nine journalists hop to private-public power hot spots*

# BY AIRFARI



Controversial private-public power hot spots like Niagara Falls and Hells Canyon, the Northwest Power Pool, and engineering progress in the electric utility industry have taken on a new meaning for a group of nine newsmen.

For ten days this group travelled some 10,000 miles to get first-hand information about the electric power industry. They were guests of the National Association of Electric Companies whose president is Purcell L. Smith. At every stop they made they were greeted by top power company executives. The airfari was directed by Raymond C. Baker, a partner of Stephen Fitzgerald & Co, NAEC's public relations counsel.

Purpose of the trip, according to Smith, was to show the national writers that the industry was more than able to furnish the nation's power needs without large expenditures of tax dollars for federal power projects.

Accompanying Baker were: Robert G. Brunn, assistant American news editor of the Christian Science Monitor; Edward Jamieson of Bascom N. Timmons news service, which represents some 18 newspapers in the Southwest; Charles B. Seib, assistant bureau manager of Gannett News Service; David Sentner, Washington manager of the Hearst newspapers; Donald H. Shannon of Western Reporters, which represents a number of papers in the Far West; Roger W. Stuart of the Scripps-Howard Newspaper Alliance; J. Louis Donnelly of the New York Journal of Commerce, Vinton E. McVicker of the Wall Street Journal; and Herbert R. Frankel of Electrical World.

The party took off from Newark airport on Nov. 12. Seeing them off was NAEC's Chairman R. A. Zachary, who is also vice president of the Public Service Electric & Gas Co.

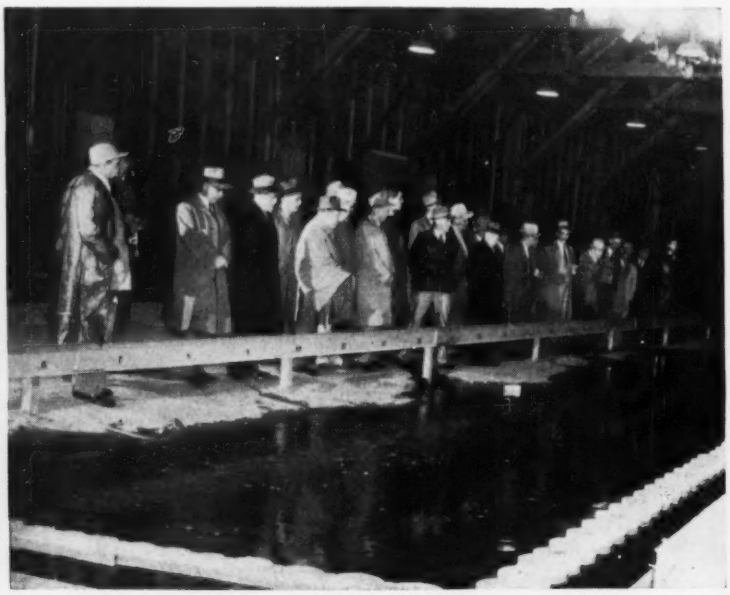
While in Buffalo the newsmen flew over Niagara Falls in a helicopter. They also visited the controversial Niagara

**Niagara Falls** Two newsmen take off for air view of Falls

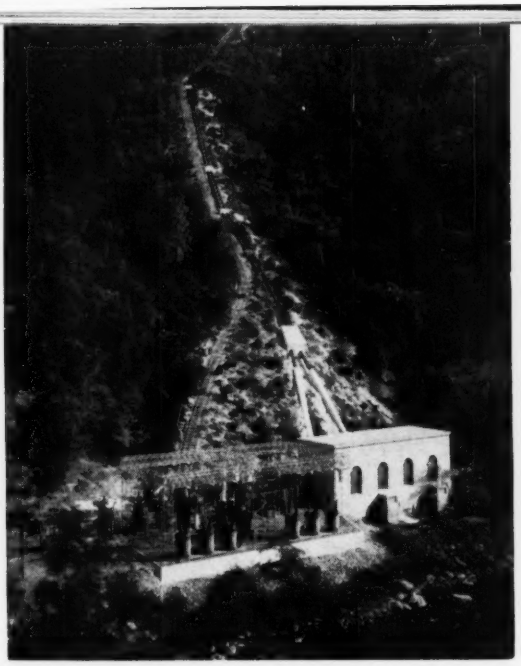
**Niagara River** Group looks down at the Niagara site where power companies expect to build their plant

site where the five New York private companies, Central Hudson Gas & Electric, Consolidated Edison, New York State Electric & Gas, Niagara Mohawk Power, and Rochester Gas & Electric, are proposing to develop an additional 1.1 million kw of power if they get the necessary governmental approval. The Capehart-Miller-Dondero Bill, known as the private enterprise bill, has already passed the House of Representatives and is now before the Senate Public Works Committee for action. The proposed project will be almost diagonally across the Niagara River from where Canada's Hydro Power Commission of Ontario is now constructing its Niagara plants.

On arriving in San Francisco, the group spent nearly a day seeing the many hydro plants of the Pacific Gas & Electric Co on the Feather River. The waters of this river are used over and over again to generate electricity. They also were told about the ultimate $75 million, 274,000-kw Kings River project. After lengthy litigation the Interior Department only recently withdrew its objections to the development of this project by the company.



**Bonneville** Salient features of working model of Bonneville Dam are pointed out by Col T. H. Lipscomb. On a tour of the dam the newsmen (above right) view the Corps of Engineers' operating model of The Dalles Dam which they are building



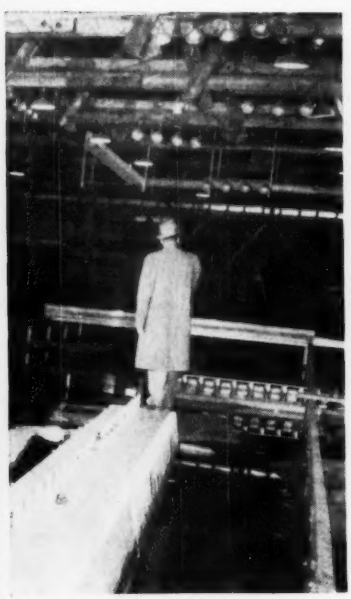
**San Francisco** California highlight was tour of PG&E's Buck Creek Station

**Portland** Huge shaft shown on the left connects water wheel with generator at the 125,000-kw Yale Plant of Pacific P&L

Portland was the next stop. On the agenda was the 125,000-kw Yale hydro dam of the Pacific Power & Light Co. The second unit in this plant had been placed in operation only a few hours before the newsmen arrived. The chairman of the board of the Portland General Electric Co told the journalists that private companies in the Pacific Northwest may in the future pool their resources to build large hydro projects, but he felt that Congress will have to advance funds to provide navigation and flood control features.

At Bonneville Dam Col Thomas H. Lipscomb, Portland District Engineer of the Corps of Engineers, conducted a tour of the project and showed the group an operating model of The Dalles Dam, now under construction at the head of the Bonneville pool.

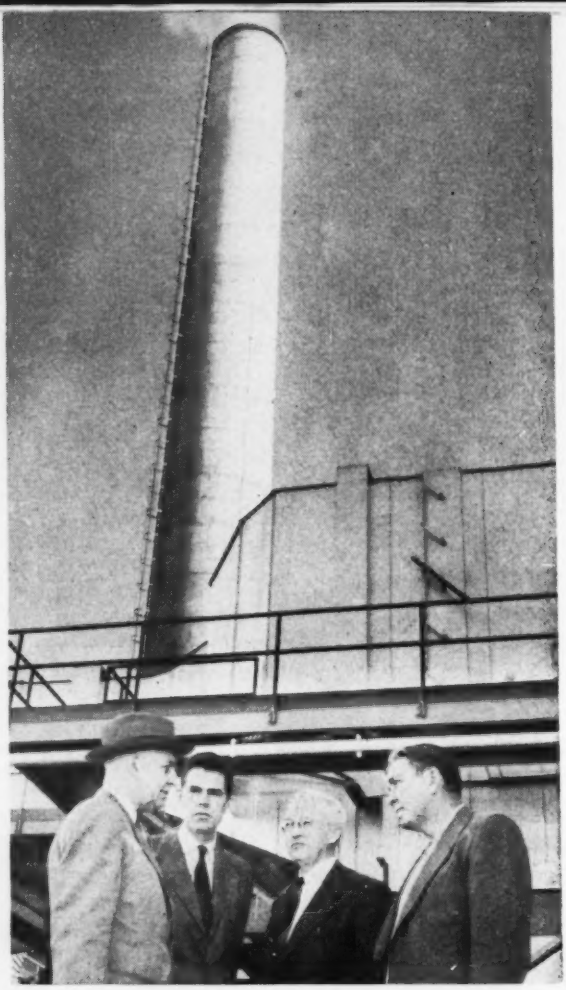
At the next port of call, Spokane, the party was met by official greeter Miss Spokane (Connie Oldershaw) who said "Kla-How-Ya-Sikhs Tilakum": Hello Friend, Glad to See You. She acted as escort to the Monroe Plant of Washington Water Power Co. Constructed in 1889, it is one of



**Snake River** Above the deep canyon site of Idaho Power Co's Oxbow, Brownlee, and Hells Canyon hydroelectric stations which will generate over 900,000 kw of energy

**Spokane** Traditional peace pipe is presented by Miss Spokane to one of the visiting braves from the east

**Butte** Clad in coveralls and hard hats, the group is ready to descend 700 ft into a copper mine in Butte area



**Denver** A steam plant at last. It is Public Service Co of Colorado's 132,000-kw Arapahoe Plant built in 1950

the oldest hydro plants operating in the United States. Two of the present units with a total name plate rating of 7,200 kw have been in operation since 1903. It was here that Miss Spokane presented the traditional peace pipe under the watchful eyes of two of her "braves."

The visitors learned about the Northwest Power Pool, one of the largest in the world. It covers some 800,000 sq mi and includes 190 power plants and 11 major watersheds. Bonneville's system was brought into the pool in 1942. This pool produced during World War II at least 100,000 kw of additional power, enough to build one 10,000-ton Liberty ship every day of the year, 10,000 lb of aluminum every hour. Under present operations the pool saves some 500,000 kw.

The controversial Hells Canyon project on the Snake River was discussed in Boise. The journalists were taken on a 600-mile plane trip up the river to see where the Idaho Power Co is planning to build its Oxbow, Brownlee, and Hells Canyon projects if approved by Federal Power Commission. Hearings are now being held before the FPC. These plants will add 900,800 kw of capacity to the company's lines. Company executives revealed that if the government develops this river the cost will run around $430 million while Idaho Power is planning to spend only $133 million.

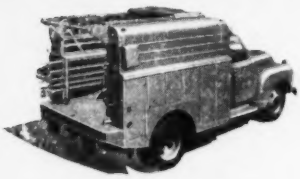
A quick stop was made at Great Falls, Mont., where a tour was taken of the Anaconda Wire & Cable Co plant.

Butte, Mont., was next. Here the boys donned coveralls and hard hats and were taken down into the copper mines of the Anaconda Copper Co. An executive of the Montana Power Co told EW that there never will be enough power in the Pacific Northwest until the full development is placed "squarely on the shoulders of private power."

Before heading for home the plane set down in Denver. There executives of the Public Service Co of Colorado told of the excellent cooperation existing between the company and the U. S. Bureau of Reclamation. The USBR has around 175,000 kw of generating capacity in Colorado. Public Service is presently constructing an additional 176,000 kw of generating capacity to take care of the future growth of the territory. Another 100,000 kw is in the planning stage. When this construction program is completed, the total capacity for the company will be 648,000 kw. While the newsmen were in Denver, the company connected its 250,000th meter.

Best summary of the trip was made by one of the Washington newsmen: "I've been filing stories on power legislation for years. But this was the first time I've ever been in a power plant. In the future I'll know a lot more about what I am doing."

# UTILITY WORKHORSE-



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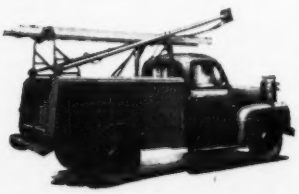
Completely equipped to carry all tools and materials needed for line work. Can be furnished with winch and derrick, compressor, digger, or any special equipment required . . . for use in any phase of the utility industry. Available in 9′ to 14′ lengths, with or without built-in crew compartment.



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**HYDRAULIC TOWER**
Available in sizes from 21′ to 30′. Platform revolves full 360°. Tower can be operated from cab or platform.

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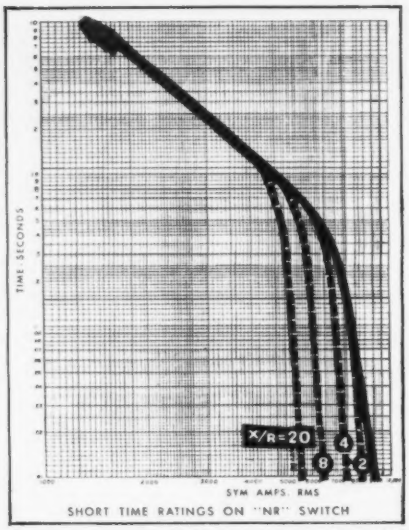
**200-amperes nominal load rating at 14.4 kv, 150 amperes for capacitor switching. 9000 amperes RMS asymmetrical momentary current rating.**



SHORT TIME RATINGS ON "NR" SWITCH

Data 235A

# L-M's "NR" Remote Control Oil Switch Provides Low Cost Capacitor Switching

**Here is L-M's new motor-operated 200-ampere remote control oil switch. It is specially designed for low-cost capacitor switching up to 3500 kvar 3-phase, but is equally suitable for street lighting, flood and airport lighting, protective lighting, sectionalizing, and other remote control switching applications. Ratings meet users' needs and requirements for capacitor switching and many other applications.**

The contact structure is so designed that heavy currents increase contact pressure and give the switch high momentary and short-time current ratings. Spring-loaded contacts give very fast "make" and "break"—which eliminates restrikes and minimizes contact erosion when closing in on large capacitor banks.

The switch can be bolted directly to the pole, or crossarm with a thru-bolt or crossarm-mounted with a clamp-around hanger. Clips also available for mounting on substation steel structure.

Control motor requires less than one ampere at 120 volts, which permits the lightest wiring, simpler control circuit, and gives longer life for limit switches and relays.

### Get Full Information

Ask the L-M Field Engineer for details on this new Type NR Switch—or write Line Material Co., Milwaukee 1, Wis. (a McGraw Electric Company Division).

### Type "NR" Switch Ratings

SINGLE PHASE

VOLTAGE

| | |
|---|---|
| Nominal | RMS 14.4 kv |
| Maximum design | RMS 15.0 kv |
| 60 cycle, one minute withstand, dry | RMS 35.0 kv |
| 60 cycle, ten-second withstand, wet | RMS 30.0 kv |
| 1½ x 40 Ms impulse withstand, crest, BIL | 95.0 kv |

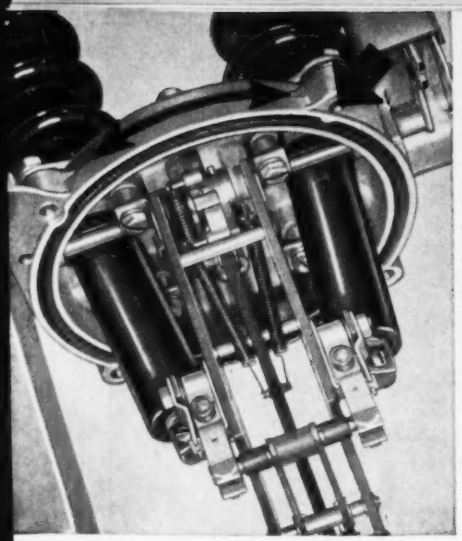
CURRENT

| | |
|---|---|
| Thermal | 200 amperes |
| Capacitor switching, nominal | 150 amperes |
| Inductive load switching, | |
| 75 to 100% PF | 200 amperes |
| 50 to 75% PF | 100 amperes |
| Less than 50% PF | 50 amperes |
| Momentary, RMS Asymmetrical | 9000 amperes |
| Short-time, RMS Symmetrical | |
| 10 seconds | 1400 amperes |
| 1 second | 4500 amperes |

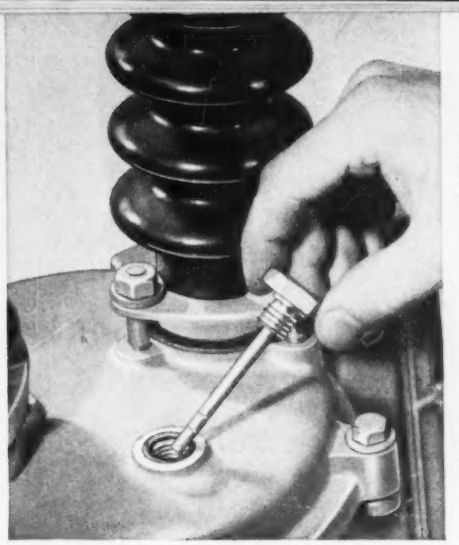
For larger ratings at shorter time intervals see curve, Data 235-A above.

CONTROL

Motor-operated actuator requires less than one ampere at 120 volts. Permits simplest control circuit and gives long life of limit switches and control relays.

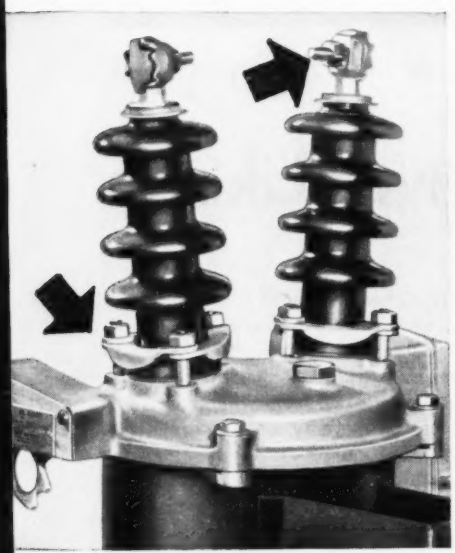


Head may be rotated and set at desired position. Lips in the groove on the underside of head hold the gasket so that it doesn't fall out when the cover is lifted.

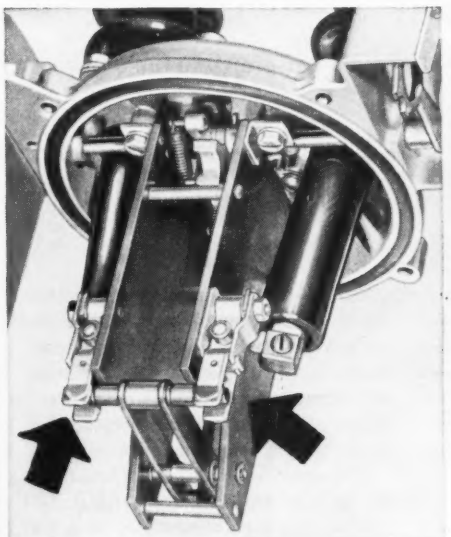


Oil dip stick on the head for checking the oil level. The tank holds 1½ gallons of oil. The inner mechanism is insulated from the tank by the oil and by a tank liner.

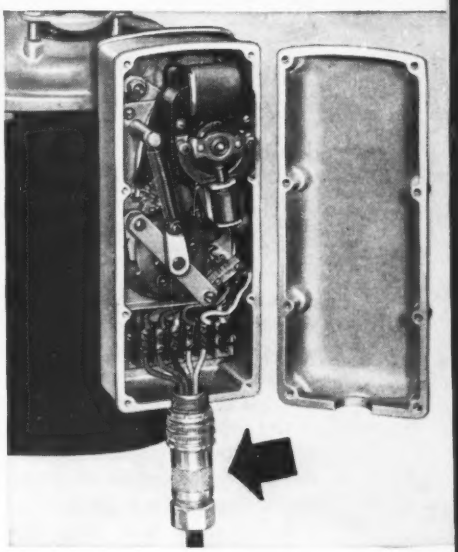
Heavy bracket for direct mounting to pole or crossarm with or without a hanger. Heavy tank, with inserted concave bottom, so that only the rim takes abrasion.



The bushings are the clamp-on type which make replacement easy. Bushings are oil-filled for lowest radio noise level. Plated Universal terminals for aluminum or copper conductor, No. 8 to 2/0.



Contacts arranged so heavy currents increase contact pressure, giving high momentary and short time current ratings. Spring-loaded contacts give quick make and break to prevent restrikes and minimize erosion.



Motor-operated actuator requires less than one ampere at 120 volts, permitting lighter wiring and simplest control circuit, and assuring long life for limit switches and relays. Weatherproof plug-in connection at bottom of box and weatherproof plug available.

**CAPACITOR SWITCHING RATING**

| Voltage | Based on 25 KVAR Units | | | | Based on 15 KVAR Units | | | |
|---|---|---|---|---|---|---|---|---|
| | Three-Phase | | Single-Phase | | Three-Phase | | Single-Phase | |
| | Bank Size KVAR | No. of Units | Bank Size KVAR | No. of Units | Bank Size KVAR | No. of Units | Bank Size KVAR | No. of Units |
| 2400 | 600 | 24 | 350 | 14 | 585 | 39 | 360 | 24 |
| 4160 | 1050 | 42 | 625 | 25 | 1080 | 72 | 615 | 41 |
| 4800 | 1200 | 48 | 725 | 29 | 1215 | 81 | 720 | 48 |
| 7200 | 1800 | 72 | 1075 | 43 | 1845 | 123 | 1080 | 72 |
| 12470 | 3225 | 129 | 1850 | 74 | 3240 | 216 | 1860 | 124 |
| 13200 | 3375 | 135 | 1975 | 79 | 3420 | 228 | 1980 | 132 |
| 13800 | 3525 | 141 | 2050 | 82 | 3555 | 237 | 2070 | 138 |

# LINE MATERIAL
## Kyle® Oil Switches

*Like all Kyle reclosers, the Type NR switch is filled with ORTO®, L-M's oxidation-resistant transformer oil, inhibited for longer life.*

98R

**The chance of having a winning holiday display like the one above is just one of the reasons why . . .**

# The People of Denver Like to

Few cities match Denver in its Christmas outdoor lighting. The mile-high Colorado city thus gives brilliant evidence that it was the first to conduct a Christmas lighting contest.

The dying wish in 1914 of the son of a Denver electrical businessman was the inspiration for an established contest that began in 1918.

This year more than 6,000 home owners installed outdoor Christmas lights. The displays range from evergreens laced with multi-colored lights to scenes of the Nativity, Santa Claus' workshop and religious choral groups. Many of the displays feature recorded music and animated figures.

Elaborate setups costing hundreds of dollars are common. Electrical appliances are offered as contest prizes, but the reward is nominal compared with the expense to which home owners go to beautify their homes in harmony with the season.

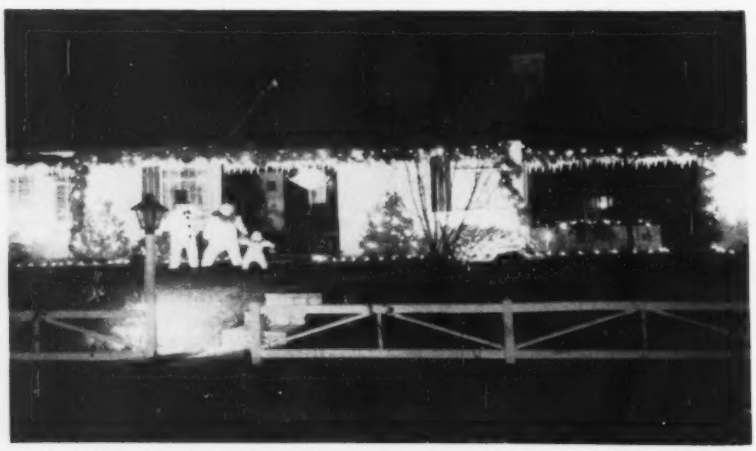
Denver's civic center lighting, dominated by the City and County Buildings' decorations, is among the most fabulous in the nation. Residents of Wyoming, Nebraska and New Mexico drive hundreds of miles to view the Denver lighting.

The Denver contest started with a wish expressed by little David Jonathan Sturgeon to his father, David D. Sturgeon, head of an electric company bearing his name. The father was placing lights on a Christmas tree in the child's room. From his bed, the boy could see through the window an evergreen tree in the front yard.

"Daddy," the boy said, "if you could put some lights on that tree outside, it would look wonderful!" To make the boy happy, Sturgeon strung colored lights on the tree in the yard.

David died soon afterward. But at the next Christmas season neighbors lighted their outdoor evergreens. The practice spread.

The Denver Electrical League, now



MODERN SNOW FAMILY welcomes visitors to a merry, modern Christmas at this new home

SANTA'S WORKSHOP provided theme for this display in Christmas lighting competition

# Make It a Brilliant Christmas

the Rocky Mountain Electrical League, asked the Denver Post in 1918 to take up the outdoor lighting idea and bring about citywide participation. The Post gave its support and the custom of outdoor lighting at Christmas time became a Denver tradition.

The Post, the Rocky Mountain Electrical League and the Junior Chamber of Commerce cooperate now in sponsoring the lighting contest.

Homeowners are encouraged to turn in contest entry blanks for two reasons, Ralph Hubbard, manager of the league, explained. The entry blank is indexed for the guidance of judges, and it also serves to inform Public Service Co of Colorado where the heaviest electrical loads are going to be. This enables the utility to take precautions to prevent burned-out transformers or service interruptions.

Members of the Junior Chamber of Commerce screen the entries, recommending a hundred or so for final review by three-judge panel. The panel is composed of different persons each year. It always includes a representative of Denver business, the artistic fields and the municipal government.

Each judge rates the entry on four factors totaling 100 points. The factors and maximum number of points possible are: general artistic effect, 45; conformity to the Christmas spirit, 20; originality, 25; ingenuity in utilizing surroundings, 10.

The contest is judged in four groups. Electrical appliances are awarded to the 25 homes with the greatest number of points; the best decorated church receives $25; the best commercial display merits a trophy, and creators of the three best children's displays receive radios.

During the height of the Christmas season, extra police have to be assigned to handle traffic in the vicinity of outstanding displays.

NATIVITY SCENE is focus of this display, which includes spinning merry-go-round, right

"EASY DOES IT" is now on tour over the Consumer Power service area. It was a feature attraction at Michigan's Hillside County Fair

# Easy Does It

Consumers Power Co's "Easy Does It" kitchen demonstration has been installed in a van and is now on tour where the 3 million people of the company's service area will be able to see it. Ideas adopted for the van were the result of extensive research by the company's home economists with a number of universities. The van carries no "handicapped" label but includes numerous ideas usable by the heart-trouble victim, the woman in the wheel chair, the woman on crutches, or the woman who simply should "take it easy".

The van was unveiled at showings at Michigan State College where homemaking experts from all parts of the state converged to inspect and evaluate it and get the benefit of the ideas in it.

The "Easy Does It" van features seven separate centers in the kitchen.

The kitchen work center is resplendent in muted pink shades with the soft pink tones balanced by equally muted turquoise and beige shades in cabinets, wallpaper and drapes.

Cabinet interiors are the soft pink, with turquoise exteriors on the lower cupboards, and sliding ribbed-glass doors on the upper cupboards.

The wallpaper, "Summer Apples", has a quiet pink background for the etched apple clusters, and the pattern is duplicated on the draperies and valances over the cabinets.

In the rest center, an attractive plastic-covered bench is upholstered in the newest plastic pink and has turquoise cushions, balanced again by a cushion in cotton "Summer Apples" fabric.

Floors are rubber tile—pink and practical—and counter tops are Formica, pink with linen tones.

Lighting was carefully designed for the kitchen work center and every fixture in the kitchen is available in stores for the homemaker.

To make sure that the van would be able to make its way across the state's highways, the company cleared the mobile train's every dimension with the State Highway department. Exterior lights were placed according to state police recommendations.

A shakedown trip to White Sulphur Springs, Va., was made partly to test the van's roadability and partly to display it at the annual national convention of the Association of Edison Illuminating Companies.

MIXING CENTER where foods are prepared for cooking and preservation with labor-saving appliances is one of seven in the kitchen layout

NO-STOOP, raised oven set in the wall (right) and counter top units make cooking as nearly effortless as can be done

READY TO ROLL, "Easy Does It" demonstration van is now going around the company's 28,000 sq mile service area

# New "TC" Core

## permits 20% average weight reduction in 3-phase distribution transformers

If load growth indicates the need for a new or expanded 3-phase system . . . with correspondingly higher rated transformers . . . here's good news. Weight of Westinghouse 3-phase distribution transformers has been drastically reduced. In most cases, the original pole will support these new units, and they're easier to hang, easier to store as well. Primary reason: A new Hipersil® Core. Tests show that the new Type "TC" Core maintains excellent performance characteristics in a much more compact core-coil assembly.

For example, the new 75-kva conventional unit weighs only 1300 pounds, fits into a round tank 22″ in diameter. This contrasts with the superseded model at 1730 pounds in a rectangular tank, 18″ x 27″.

An even greater saving in size and weight of 3-phase "CSP®" (Completely Self-Protecting) units is achieved through the use of new, smaller LR circuit breakers.

Consider, as well, the advantages Westinghouse offers in "Coastal Finish", wall-mounted bushings with unbreakable "Enrup®" knobs, and inhibited oil. Call your Westinghouse representative for complete information, or write direct to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

***Type "TC" Hipersil Cores.** All the superior magnetic characteristics of Hipersil "C" Cores are retained with a T-leg added to accommodate 3-phase coils.

J-70675

YOU CAN BE **SURE**... IF IT'S

Westinghouse

ML
125
50

*Helping the industry meet its growing loads*

# *Thermalastic*... insulation with a memory*

Thermalastic insulation is the latest magic of industrial chemistry to achieve practical application in large motors and generators. Heat it . . . cool it . . . cycle it again, Thermalastic remembers the copper to which it is applied and stays with it. Stretching does not affect its properties and it will always return exactly to its original shape.

The scope of this development challenges the imagination. Thermalastic insulation offers the industry new freedom from shutdowns caused by insulation failure.

Most insulating materials in common use today are considered excellent. But imagine the inherent protection, the vastly improved reliability, in equipment having Thermalastic insulation . . . with its superior thermal stability, outstanding moisture resistance and inertness to chemical contamination and dirt! The high voltage endurance of Thermalastic increases "time to failure" many hundred fold.

The basic materials in Thermalastic insulation are well known, their characteristics proved. The contribution of chemistry has been the development of a synthetic resin that contains the same elements as natural resin with an important molecular change. That, plus a new application technique, produces distinctive qualities that utilize fully the high insulating value of large mica flakes, and maintains them throughout the endless heat cycling that windings must endure. Thermalastic insulation will always hug its copper. It will never migrate or become brittle with age.

Evolved in the minds of engineers, developed in the laboratory, made practical on the production line, Thermalastic insulation is an outstanding example of the progress that Westinghouse offers to help you meet America's power needs.

*Trade-Mark

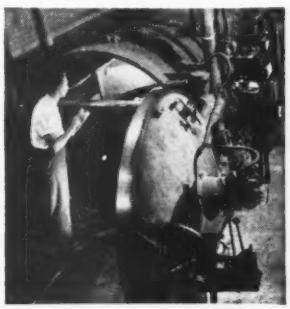
J-97176

YOU CAN BE SURE... IF IT'S **Westinghouse**

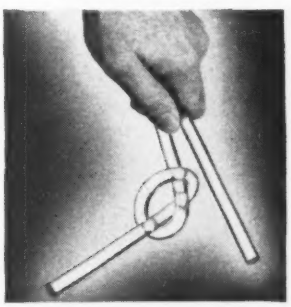
## *Thermalastic insulation*

A chemist's skill at synthesizing, plus an application technique, adds wonderful new qualities to time-proved insulating materials.

Large mica flakes are built into a resilient, flexible tape that can be wound in smooth layers, providing the highest insulating qualities known.



The synthesized resin, having low viscosity, can be made to penetrate the mica completely, leaving no voids between layers, or between mica and copper. Thermosetting, it creates no voids, will not melt.



Infinitely elastic, chemically inert, the resin will hold the mica tight to its copper regardless of heat cycling or overload. Unaffected by moisture, it will never become brittle with age.

# The Pole Star CORE makes the difference...

The patented design of the Pole Star core enables Pennsylvania to build Pole Star transformers through the full range of distribution sizes from 3 Kva through 500 Kva and from 480 volts through 67000 volts. The Pole Star core takes full advantage of the high permeability and low loss characteristics of the oriented electrical steel and provides a core with low exciting current and low core loss.

### Core Builder assembles laminations in 500 Kva Pole Star Coil

Laminations are brought through the coil and individually lapped. For ease of handling, core units for the 167 through 500 Kva sizes are constructed with four core sections. Each individual lamination forms its own magnetic path so that no flux has to cross from one turn to the next. In effect, each lamination is a core in itself.

*For complete information on 3 through 500 Kva Pole Star Transformers, write on your letterhead for free copy of Catalog No. 953.*

PENNSYLVANIA POLE STAR TRANSFORMER

**PENNSYLVANIA TRANSFORMER COMPANY**

A McGRAW ELECTRIC COMPANY DIVISION

**CANONSBURG, PA. • *Greater Pittsburgh District***

# Pepco Names Wilson a VP

**Newly elected official will assume responsibility for the administration of the commercial department**

ROBERT W. WILSON

Robert W. Wilson, executive assistant to the president of Potomac Electric Power Co., has been elected vice president of the company.

As vice president, Wilson will continue with his present duties in connection with the utility's public relations and publicity programs and will assume responsibility for the administration of the commercial department of the company.

Wilson joined Pepco in 1936 as assistant to the president. He was made treasurer in 1938 and executive assistant to the president in 1947.

During World War II he served with the Navy as a lieutenant commander attached to the Office of Chief of Naval Operations.

# Roy N. Vernstrom Is Promoted

Pacific Power & Light Co's program to reactivate sales and customer contact work has brought appointment of Roy N. Vernstrom to the position of general sales manager from his recent assignment as assistant general manager in charge of the utility's operations outside Portland. Assigned as a principal assistant to the new sales department executive is C. A. Root, acting commercial manager for the past year. In another assignment to the sales organization Louis P. Growney was named industrial development engineer.

ROY N. VERNSTROM

**Vernstrom's Successor . . .** Succeeding to the assistant general manager's job is M. C. Thorn, a 34-year veteran of the company who since 1949 has been district manager at The Dalles, Ore. At the same time, PP&L Vice Pres and General Manager George T. Bragg announced transfer of Arthur M. Thrasher, district manager at Enterprise, Ore. to The Dalles; the promotion of Bernard O. Thomas from line superintendent at Hood River, Ore., to the Enterprise position, and selection of James R. Dawson from the construction department to succeed Thomas at Hood River.

Vernstrom has been with PP&L since 1947, when he was hired as advertising manager. Before joining PP&L he was an account executive for a Portland advertising agency. Vernstrom, a World War II veteran of the Marine Corps, is a graduate of the University of Oregon.

F. W. WEHRHEIM

## Wehrheim Made Sales VP of Appleton Electric Co

Appleton Electric Co, Chicago, has announced the election of F. W. Wehrheim as vice president in charge of sales. Wehrheim, a thirty-three year veteran of Appleton Electric, succeeds E. A. Murray who has resigned to return to his former employer, American Steel and Wire Division of United States Steel Corp.

The company has also appointed I. W. Strong as assistant to the vice president in charge of sales. Strong, a former Denver sales representative for Appleton Electric, will make his headquarters in Chicago.

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**Dr Lester M. Field** of Stanford University has been appointed professor of electrical engineering at the California Institute of Technology, where he has been a visiting professor since last January. Dr Field, who graduated from Purdue University in 1939 and received his Ph.D. degree in electrical engineering from Stanford in 1944, joined the Stanford faculty in 1946.

**Frederick N. Allen** has been named a commissioner of the Maine Public Utilities Commission to replace **George E. Hill,** who has resigned.

# *Roeplastic control cable—*

# THE ONLY CONTROL CABLE WITH CIRCUITS *POSITIVELY* IDENTIFIED

THIS NEW Roebling ROEPLASTIC Control Cable makes circuit identification quick and certain for the first time in history. A workman can't go wrong even if he's color blind. Here's why:

In ROEPLASTIC Control Cable, each conductor is identified from end to end by both its IPCEA code color name and its individual number by means of an indelible printing against a strongly contrasting background. The printing is permanent; it cannot fade or rub off... identification is always positive whether plans show circuits by color code or by numerals.

Roebling ROEPLASTIC Control and Signal Cables are ideal for such purposes as remote control of motors, switch gear, automatic machinery, etc.... for traffic light control, relay, metering and supervisory circuits. They are made in constructions, types of insulations and over-all sheaths to meet every specific requirement. Write for technical data... and order ROEPLASTIC Control and Signal Cables from your Roebling distributor. John A. Roebling's Sons Corporation, Trenton 2, N. J.

*Subsidiary of The Colorado Fuel and Iron Corporation*

**ROEBLING**

ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST & 5 PITTSBURGH ST • CHICAGO, 5525 W. ROOSEVELT RD • CINCINNATI, 3253 FREDONIA AVE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 E. HARBOR ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • ST. LOUIS, 3001 DELMAR BLVD • TULSA, 321 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, NEW JERSEY

# Wishart Heads Honeywell

PAUL B. WISHART

Minneapolis-Honeywell Regulator Co has appointed Paul B. Wishart, vice president and general manager, to the post of president of the company. Wishart, who becomes the fourth man to hold the presidency of Honeywell in the firm's 68-year history, succeeds Harold W. Sweatt.

Sweatt, president of Honeywell since 1934, has been elected chairman of the board to replace Mark C. Honeywell, who was named honorary chairman.

In taking over the chairmanship of the board, Sweatt succeeds the man he also succeeded as president. Honeywell was president of the firm from 1927 until 1934.

**Two New Directors . . .** The company also elected two new directors. They are: Tom McDonald, vice president in charge of sales; and A. M. Wilson, vice president in charge of the firm's Aeronautical Division.

All these top-level management changes coincided with the retirement of four officials. The retiring officials include: W. L. Huff, director, executive vice-president, and former treasurer; R. P. Brown, vice president and chairman of the board of the firm's Industrial Division; George A. DuToit, vice president in charge of manufacturing; and L. Morton Morley, vice president and formerly in charge of sales for the Industrial Division.

Honeywell, Huff, and Brown will continue as directors.

Wishart joined Honeywell in 1942 after spending many years in the automobile industry. He became superintendent of manufacturing for Honeywell in 1943, factory manager in 1945, vice president in charge of manufacturing in 1946, and vice president and general manager in 1952.

## Cooper Appointed a VP of United Illuminating

William J. Cooper, assistant to the president of United Illuminating Co, New Haven, Conn., has been appointed vice president in charge of operations.

Cooper joined United Illuminating in 1942 as assistant to the treasurer. He served as director of employee relations and supervisor of purchasing and stores before becoming assistant to the president.

WILLIAM J. COOPER

Prior to joining the Connecticut utility, Cooper had worked for Georgia Power Co, Central Hudson Gas & Electric Corp, and Line Material Co of Milwaukee, Wis.

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**Manley E. Lord,** manager of General Electric Co's fractional horsepower motor department at Fort Wayne, Ind., has retired after 46 years' service with the company. Lord, with GE since 1908, became department manager in 1947 after having served as Fort Wayne Works manager for eight years.

**William J. Cadigan** has been named publications director for the New England Power Service Co, a subsidiary of New England Electric System. Cadigan, who joined NEES in 1947, has been assistant director since 1950. He replaces **Wilbert E. Miller,** who has been appointed sales promotion manager for the NEES Gas Division.

**Fred M. Winterhalter,** engineer-in-charge of ac design for the electrical section of the Norwood Works of Allis-Chalmers Manufacturing Co since 1949, has been named chief engineer of the section. **Carroll F. Cobb,** engineer-in-charge of dc design for the last four years, has been made assistant chief engineer of the electrical section. Winterhalter joined A-C in 1936 and Cobb in 1924.

## Elected a Vice President

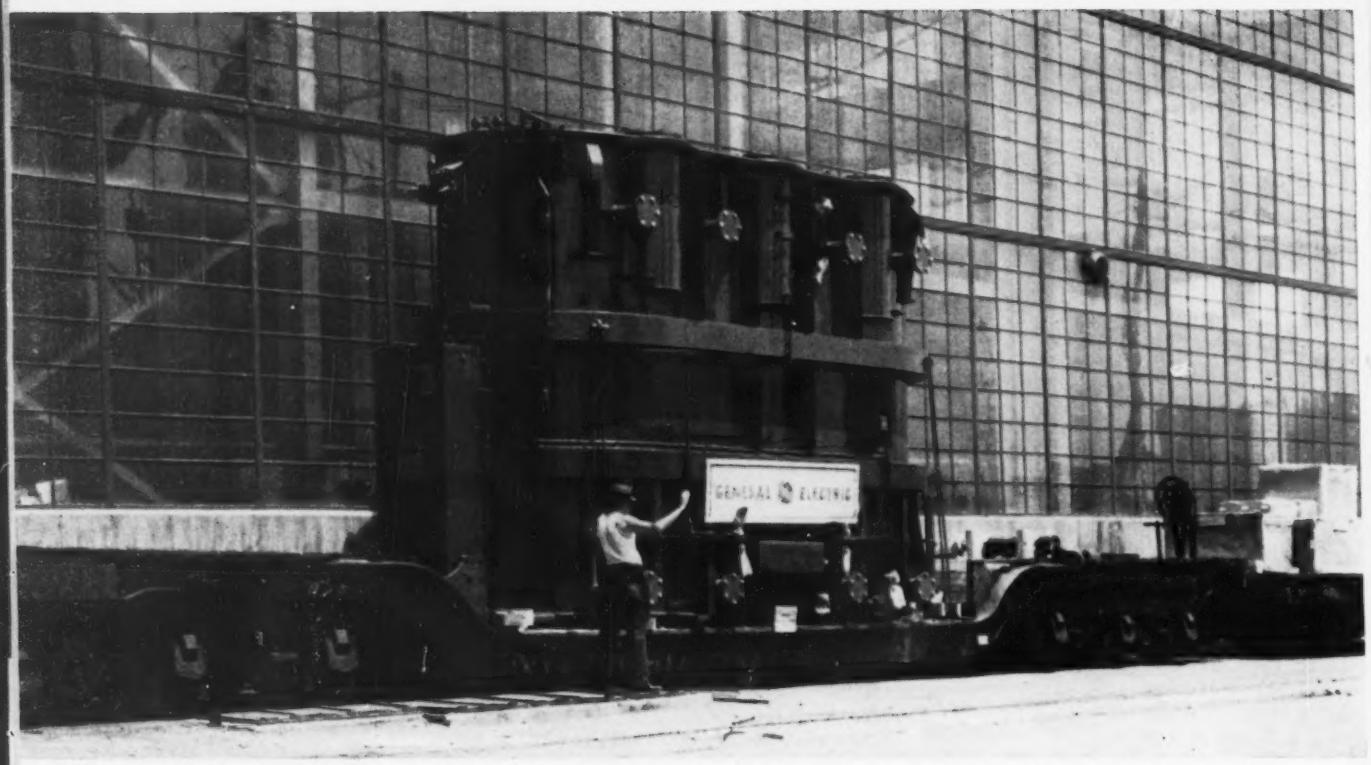
H. H. Levonian has been named vice president in charge of construction of Kuljian Corp, Philadelphia engineers and constructors. The newly elected official has had 24 years' experience in the engineering and building of power and chemical processing plants in the United States and abroad. Among the larger projects he has supervised are the Bokaro steam power station in India, and the Palermo power plant in Sicily, Italy.

## OBITUARY

**Theodore J. Rostocil,** 48, an electrical engineer on the Federal Power Commission's Bureau of Power staff in the San Francisco Regional Office, died recently at Berkeley, Calif. Rostocil, who joined FPC in 1941, had been with the San Francisco Regional Office since 1945.

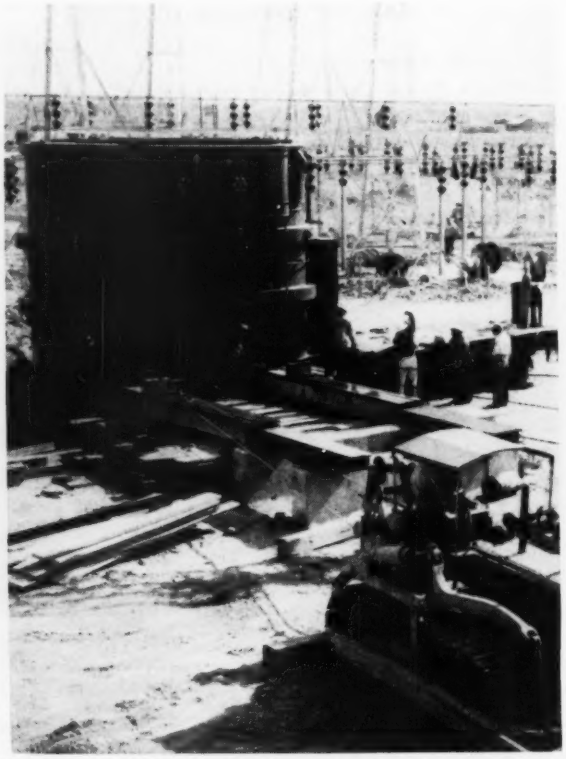
**Clyde A. Turner,** 73, former general manager of Concord (N. H.) Electric Co, died at Lowell, Mass., Dec. 5. Turner assumed the general managership in 1938 and retired from the Concord utility in 1943.

**George A. Matthews,** 67, retired inspection and equipment engineer for Detroit Edison Co, died Nov. 24. Matthews, who joined Detroit Edison in 1916, was responsible for numerous improvements in high voltage transformers and switchgear and had 20 U. S. patents.



**TRANSFORMER** ready to leave the plant where it was manufactured looked like this. The tank is upright on the underslung railway car at the left. The flat car at the right carries the bushings, unit coolers, and some of the accessories. Removing the accessories prevents any

**CRIBBING** is placed between the car and transformer piers. The unit is then jacked up, each end alternately, and the skid beams placed



**TRACTOR AND CRANE WINCHES** slowly pull the transformer, resting on a thin steel plate, across heavily greased skids to its foundation

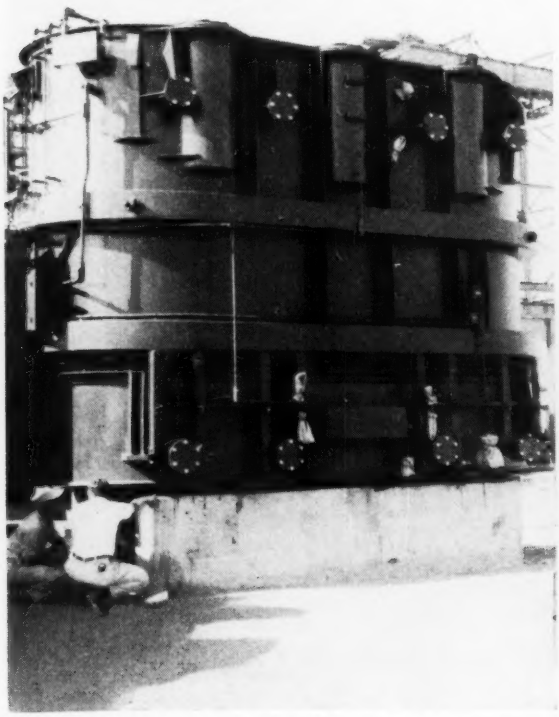
# Transformer Ready; Time: 51 Hours

damage to them in transit and simplifies the job of the railroads in getting the shipment to its destination in the shortest time possible

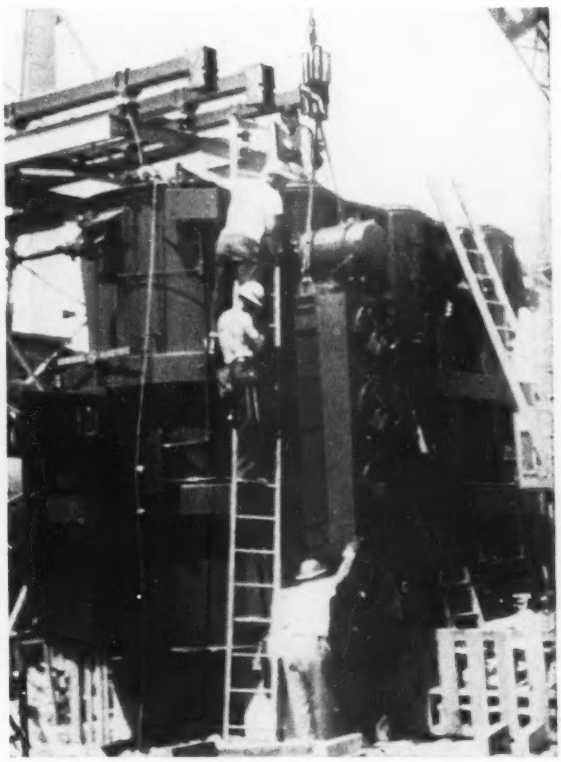
Experience has made installation of large power transformers a routine job. Last June General Electric Co installed two for the Mississippi Power & Light Co, each in 51 hours of working time. The transformers were rated FOA-T, 60 cycles, 135,000 kva, 115,500 Gr Y volts to 13,860 v. The installation was made at the Delta Station of the company near Cleveland, Miss. The station is designed for a maximum capacity of 210,000 kw.

Here is the time schedule for the installation following delivery of a unit to the site: Placing of the cribbing, 2 hours; jacking and skidding the transformer to its foundation, 9 hours; final locating and lowering of the unit, 7 hours; inspecting parts to be assembled, 4 hours; mounting all coolers, 8 hours; drawing a vacuum, filling with oil, wiring of coolers and other accessories, placing of baffles to prevent recirculation of air, 9 hours; internal inspecting and placing of high and low-voltage bushings, 8 hours; connecting low-voltage leads and placing and connecting the remaining accessories, 4 hours. The unit was then ready to be tied to the system.

Part of the work on each unit was carried on simultaneously; so total time was less than 102 working hours.



**FINAL ALIGNMENT** is checked by field engineer. Unit must be properly located so that weight is distributed correctly and conduit aligns

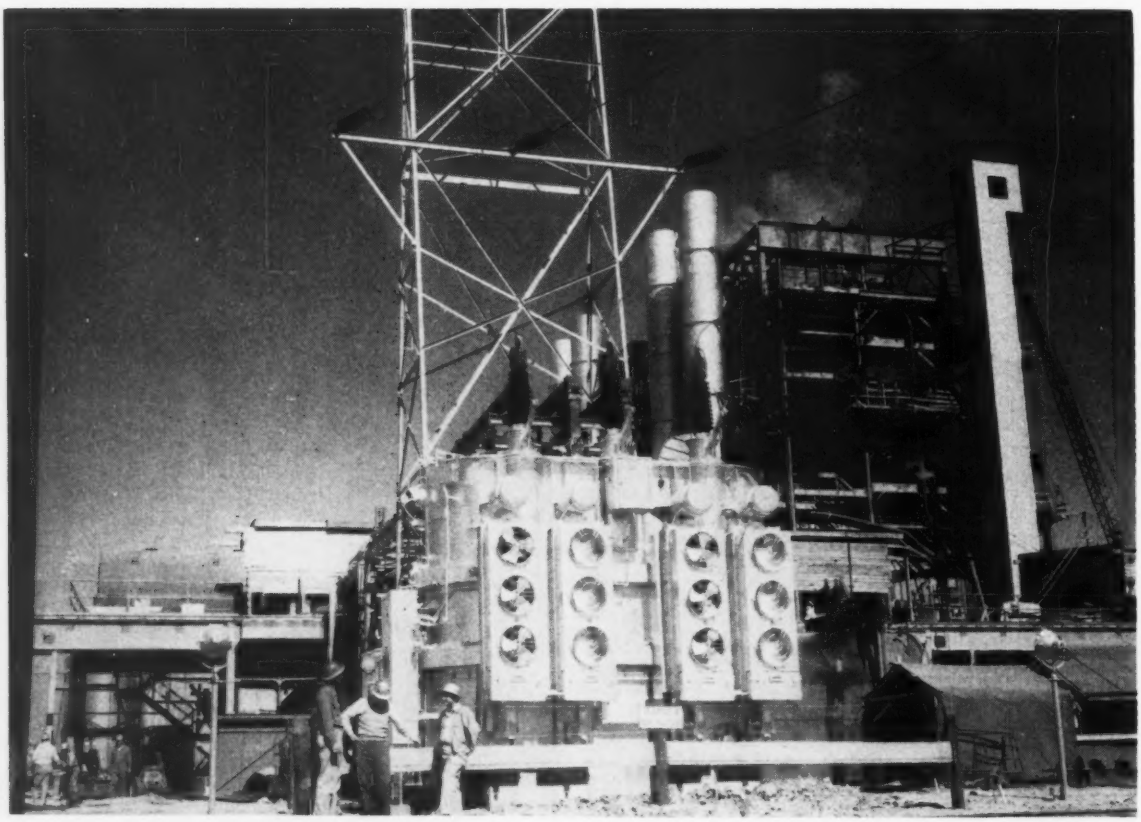


**UNIT COOLERS** are assembled first. Pump on the top forces the warm oil down through finned radiator tubes where it can be cooled by air

HIGH-VOLTAGE BUSHINGS are installed. Leads from inside the tank are pulled up through tube in bushing center as the latter is lowered

## Additional Statistics on Delta Plant Transformers

Total weight . . . . 305,500 lb
Weight of core and coils . . . . 187,500 lb
Weight of oil . . . . 61,000 lb
Quantity of oil . . . . 8,210 gal
Weight of copper in windings . . . . 56,648 lb
Length of copper in windings . . . . 88,561 ft
Weight of steel in core . . . . 89,140 lb
Overall length . . . . 21 ft 3 in.
Overall width . . . . 15 ft 7 in.
Overall height . . . . 21 ft
Installed in a generating station for step up service.



COMPLETELY INSTALLED TRANSFORMER has as its background the new Delta Station of Mississippi Power & Light into whose system transformer is ready to be connected. Total installation job took 51 hours. For additional data on the transformer see the panel above

# 3-Way Debate on Niagara

## Congressmen Miller and Roosevelt and New York Power Authority Chairman Burton present their views on project

WILLIAM E. MILLER

Leading proponents of three different plans for development of an additional 1.1 million kw at Niagara Falls presented their cases before a crowded luncheon meeting of the City Club of Rochester Dec. 12.

The debate was marked by sharp exchanges among the three speakers —Congressmen Franklin D. Roosevelt, Jr (D-Lib-N. Y.), and William E. Miller (R-N. Y.) and John E. Burton, chairman of New York State Power Authority.

Roosevelt argued for public development of the Niagara project with preference to public agencies in sale of the power; Miller, whose bill for private development already has passed the House, advocated construction of the project by five New York utilities; and Burton supported state construction with no preference to public agencies in sale of the power.

**Will Amend Bill . . .** Roosevelt is a co-sponsor with Sen Herbert Lehman (D-N. Y.) of a bill which would provide for construction of the project by U. S. Army Corps of Engineers with sale to New York at cost for ownership and operation. At the Rochester meeting he announced he would amend this bill in the next session to provide for state construction.

The Democratic Congressman said he had changed his position on who actually should construct the project after the State Power Authority had received a Federal Power Commission license to construct a hydro project on the St. Lawrence River. Construction of this project, he pointed out, would give the authority engineering experience which he said it formerly lacked.

In his speech Miller emphasized the proposed project did not involve government functions of irrigation, reclamation, or flood control. Only thing involved, he said, was generation, distribution, and sale of electric power. And he termed these operations of the electric power business.

**Rules Out 'Giveaway' . . .** The upstate New York Republican denied the private project was a "giveaway," noting that it would be subject to regulation by both Federal Power Commission and New York Public Service Commission.

Referring to the argument that state construction and operation would mean cheaper power because of tax avoidance, the GOP legislator declared: "The government can never give you anything. It first has to take it away from you." He added that generally tax advantage government power has over private power is offset by inefficiency of government operation compared with private operation.

**Insists on Preference . . .** Roosevelt was adamant on the point that preference should be granted to municipal and public agencies in the sale of the power. If this is not done, he said, the benefits of public construction will be passed on to the private companies and the savings to the public diluted. He said the Dewey-Burton plan means turning the power from Niagara over to the companies at the busbar and termed the state plan "the second line of defense of the companies to grab off Niagara power."

On the other hand Burton seemed equally determined that preference in the sale of power would defeat equitable distribution. He said the state plan provided for integration of power from the St. Lawrence and Niagara with the output from the private companies. Such an arrangement, he declared, would make possible distribution of the publicly produced power both to customers of public agencies and private companies.

**Question Period . . .** In a question and answer period following the speeches, Alexander M. Beebee, president of Rochester Gas & Electric Co, asked a question that drew some applause. He wanted to know: "When an electric bill per family is in the order of 17¢ a day and the average tax bill is $5, where should the emphasis be placed in reducing costs?"

Roosevelt brushed the question off as irrelevant, adding that private development would mean higher taxes (presumably for the utilities). Earlier he had asserted utility taxes ultimately are paid by consumers as part of their electric bills.

FRANKLIN D. ROOSEVELT, JR

JOHN E. BURTON

# How to Increase

## *Field Proved Mechanism*

You get a time-tested mechanism in Allis-Chalmers distribution regulators. For twenty years in thousands of applications this mechanism design has proved itself as the most efficient means of changing taps under load. Laboratory tests show it can withstand over 5 million operations — equivalent to more than a century of operation.

## *Long-Life Contacts*

An important reason why you get satisfactory regulation with a minimum of trouble from A-C distribution regulators is their long-life contacts. Made of arc-resisting materials, contacts are of large size. Laboratory tests prove that they can stand up under the equivalent of forty years of normal operation.

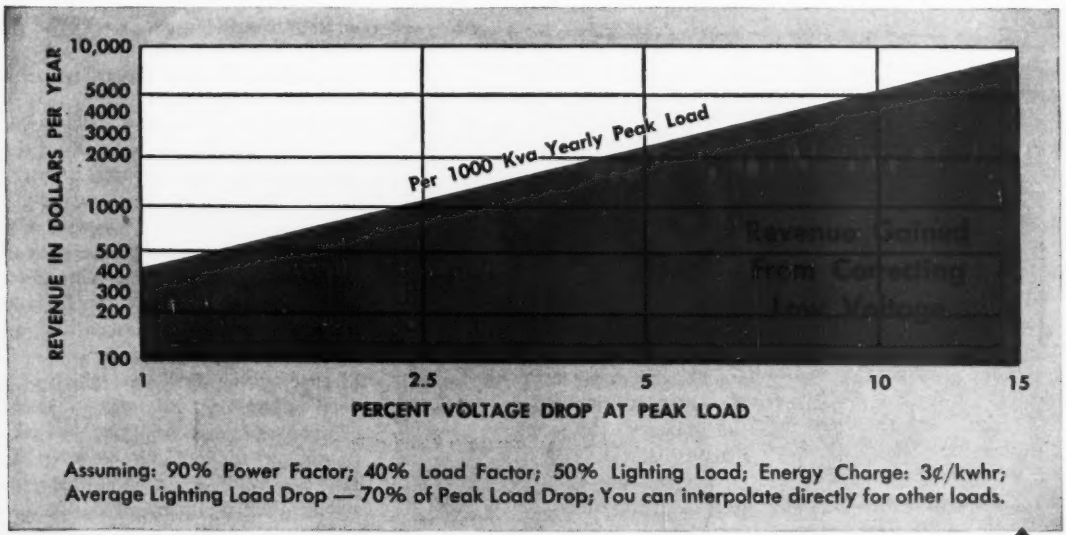
# System Revenue

YOU CAN INCREASE PROFITS on nearly every feeder by improving voltage with Allis-Chalmers distribution regulators. The chart shows how accurate voltage within a narrow ± 1 volt band pays off. And the cost is low. Users report that in most cases regulators will pay back their cost within two years.

Best of all, adding Allis-Chalmers distribution regulators to your system is as easy as it is low-cost. You can hang them on a pole right near the load — or put them on a platform between poles. Some users mount them on simple foundations right next to the substation transformer.

It will pay you to get all the facts about Allis-Chalmers distribution regulators from your nearby A-C district office. Or, write Allis-Chalmers, Milwaukee 1, Wis.

A-4182




Assuming: 90% Power Factor; 40% Load Factor; 50% Lighting Load; Energy Charge: 3¢/kwhr; Average Lighting Load Drop — 70% of Peak Load Drop; You can interpolate directly for other loads.

# ALLIS-CHALMERS

A-C ALLIS-CHALMERS

## *Unit Construction*

**You get assurance of years of satisfactory service from A-C distribution regulators, thanks to unit construction. All connections are made and thoroughly inspected before tanking—assuring top-quality workmanship. Same feature makes untanking and inspection easy because core, coils, cover, and control form a single unit.**

## *Simplified Maintenance*

**You don't need highly trained servicemen to handle Allis-Chalmers distribution regulators. Take the control, for example. It is simple. Knobs are calibrated and easy to adjust. If needed, you can remove and replace the entire control merely by pulling a single jack plug — there are no other connections to break.**

# Asks Engineers Aid Social Progress

**● Gwilym Price, Westinghouse president, tells ASME morality and social institutions must be made to catch up with scientific triumphs technologists have created**

**● Electrical maintenance, outdoor plants, stack emission are among subjects discussed in technical sessions of society's 74th Annual Meeting in New York**

Engineers should join together to give their talents, prestige and integrity to a broader cause than engineering—the social and moral improvement of mankind.

Gwilym Price, president of Westinghouse Electric Corp, urged this action at the 74th annual meeting of American Society of Mechanical Engineers in New York.

"Although he is so admirably fitted for the roles of citizen and public servant," he commented, "it is my impression that the engineer has tended to stay clear of such commitment."

Engineers have successfully applied engineering principles to science, technology and industry, he pointed out. Now, he said, the nation's hope lies in part in the application of those principles to our social problems.

"With all possible deference, I suggest that the engineer—the man who knows most about the physical facts of the world—should attempt to make that application. I suggest that your people undertake a greater share in meeting the crisis we face. I ask that you help to bring sound and efficient management to government at all levels; that you analyze and attack crime, illiteracy, poverty and slums as you would analyze and attack any major problem in your field; that you act as a catalyst for producing action among many groups in order to remedy conditions that are unworthy of civilized men in the middle of the Twentieth Century."

## Wants Creative Effort

Some day, he said, the inhabitants of this planet will perhaps come to their senses and devote themselves in united human effort to creative good.

"It is not enough," he concluded, "that you and your fellows have given us the stunning scientific triumphs that have blessed this land in so many ways. You must now decide whether you will not help us to use that science for even better ends. Somehow the nature of man must be made to grow spiritually and intellectually. Somehow our hearts and minds, our morality and our social institutions, must be made to catch up to the technology you have created for us. I say that this must be done, that it can be done, and that you can lead the way in doing it."

The meeting was highlighted by a large number of technical sessions. Some of the discussions held in the electrical field are summarized in the paragraphs that follow.

## Maintenance Emphasized

Engineering design activity until recently has been concentrated largely in creation of more efficient designs. But now it is becoming increasingly urgent to place greater emphasis upon the technical problems of operation and management, according to V. F. Estcourt, Pacific Gas & Electric Co. Design and operating difficulties will increase with the complications accompanying higher steam conditions and will be reflected in increased operating and maintenance labor costs, he said. Over-centralization of controls may, however, lead to diminishing returns. Also the saving in equipment operators has occasionally been offset by an increased number of control operators.

G. V. Williamson, Union Electric Co, contended maintenance had been accorded much too little consideration in association discussions. His company began to devote more attention when it found its maintenance costs substantially above those of other utilities. Out of this analysis came the realization that enhanced plant capability could far outweigh the cost of intensified maintenance to establish and sustain it. Union Electric has set up a maintenance-engineering analysis staff. It now recognizes six categories of maintenance: (1) scheduled, (2) programmed, (3) calendar, (4) breakdown, (5) indicated and (6) inspection-preparatory.

Company policy regarding reserve capacity was cited by Henry Riley, West Penn Power Co, as a factor affecting maintenance costs. Scanty reserves could necessitate overtime rates whereas ample reserves might avoid incurring them. The enlarged voice of labor organizations was also affecting the latitude of operational procedures projected by management, he said. Any excess of help apparently resulting when a base-load plant degenerates into peaking service is, for similar reasons, hard to detach according to J. D. Williamson, Dayton Power & Light Co.

## Outdoor Plants Popular

Outdoor design of power plants has grown steadily in acceptance since the first outdoor steam in 1929. In the ensuing 24 years Ebasco Services has designed and installed 164 steam generators and 155 turbine-generators in 70 outdoor plants aggregating over 10 million kw. Louis Elliott, Ebasco, traced the evolution in a contribution read by Estcourt, Pacific Gas & Electric, citing first the initial outdoor substation and next a series of outdoor hydros as laying the substantiation for outdoor steam. His associate, W. F. Friend, followed with a topicalized treatment of the factors which justify adaptation of an outdoor plant to its environment. The tendency now is, he said, to be critical about including any enclosures rather than to approach "outdoorness" as something needing justification. This was confirmed by R. A. Reid for Montana Power Co, where two years of operation of the Bird Plant at Billings has demonstrated that expenditure for the enclosure would not have been warranted.

Florida Power & Light Co has had no plant shutdown during hurricanes as a result of design factors for either indoor or outdoor plants. The company, said J. W. Keck, has now standardized on walk-ins for governor and exciter ends of turbine-generator. Houston by 1956 will have 900 Mw

of capability outdoors plus an additional 300 Mw of boilers. Having to pull a field during the 5 days of subfreezing weather of January 1951 was no deterrent to decision in favor of outdoor design for all new capacity, he said.

Saving of more than $4 per kw was achieved by outdoor design at Long Island Lighting Co plants. Equally important, according to E. C. Duffy, was the greater personnel comfort for 8-to-10 months each year. Some $1.3 million was saved on 6 boilers and another $700,000 on the turbine-generators. Erection time was not above 5% longer for boilers or 10 to 15% for the turbine units. After five years of experience the company puts semi-outdoor boilers on the "here to stay" plane and feels outdoor turbines are approaching the same recognition.

Two negative voices also were heard. E. C. Gaston, Southern Services, said the wet season on the Southern system occurred at the same time as the low of system load. Also the plants are on flooding rivers and ⅔ of the cost of power house structure will be below ground level, thus diluting the possible gain from outdoor treatment of the above-ground component. M. K. Drewry said Wisconsin Electric Power Co could see little in outdoor construction for its climatic conditions, preferring to believe that asbestos-cement enclosed plants will be cheaper to maintain than outdoor plants.

As for the immediate future B. G. A. Skrotzki gave a preview of data to be published in the January 1954 issue of "Power." Some 216 units of the 1953-6 era will have 35% of the steam generators outdoors or semi-outdoors, along with 20% of the turbine generators. All control rooms and office areas will, however, be 100% enclosed. Incidentially 13% of the new capacity will be accompanied with cooling towers.

## Limits of the Future

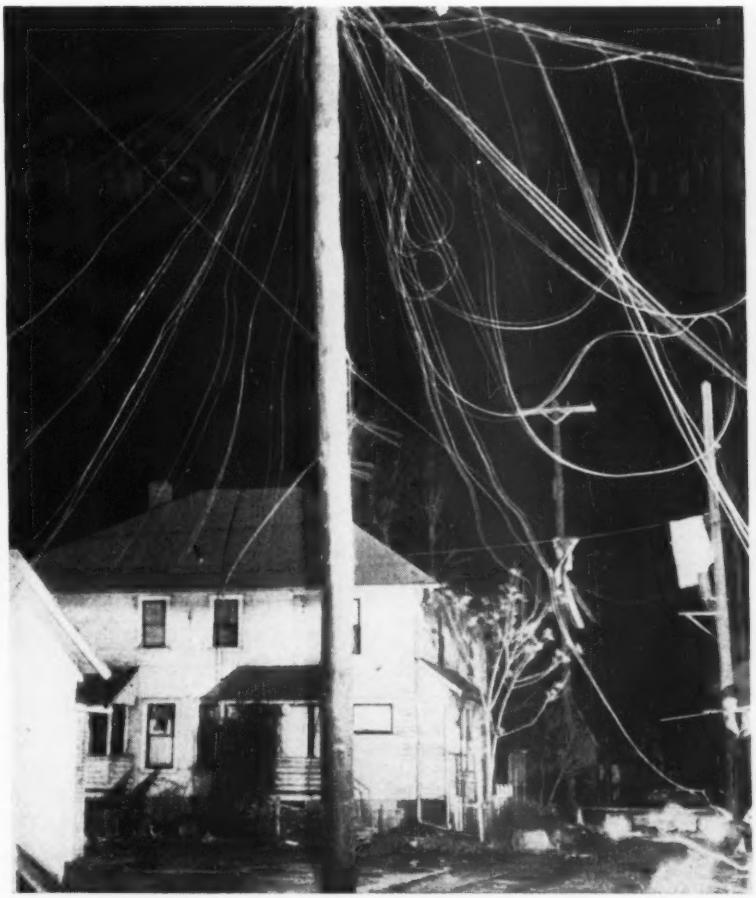
Steam pressures of 7,000 or 8,000 or even 10,000 psi along with steam temperature of 1,300 F may some day be "in the cards" when the metallurgy permits, said Alfred Iddles, president of Babcock & Wilcox, at a fuels luncheon. A thermal index of 5,000 Btu/kwhr might even be the future goal of a combined steam turbine and gas turbine if temperatures of 2,000 F could be tolerated rather than 1,200 F.

The point of Iddles' analysis of "Power Today and Tomorrow" was that these dreams for our future are no more fantastic than were our present realities when they were the visions of the Watt and the Pearl Street days. Iddles ventured the guess that unit sizes of more than 250 Mw might be approaching the asymptotic part of the curve of gain with rating.

## Plant Emission Under Study

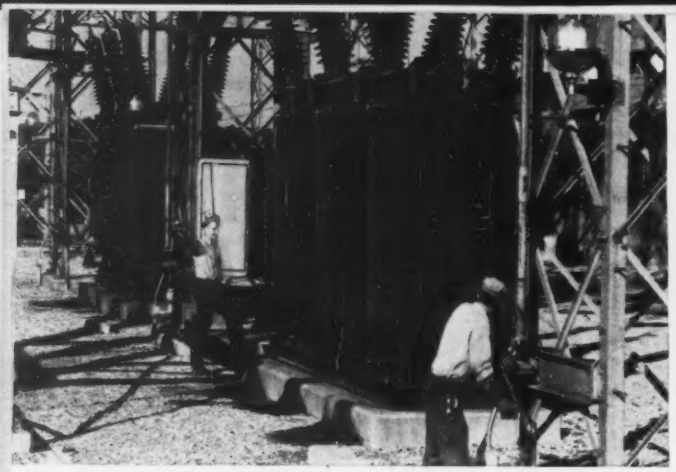
Behavior of the plume from power plant stacks is moving toward mathematical prediction as a result of wind-tunnel studies at the University of Michigan sponsored largely by Commonwealth Edison Co. Confining themselves to aerodynamic factors, Professors R. H. Sherlock and E. J. Lesher reported that roof contour and stack configuration determined (for various wind velocities, direction and gustiness) the tendency for the plume to rise, stay level or be affected by downwash.

Comment by Philip Sporn (presented by G. W. Bice also of American Gas & Electric Corp) was that he interpreted the paper as indicating that control of atmospheric discharges is now experiencing the painful transition from an art to a science. The transition will involve many facets and many years, however. Meanwhile community relations may suffer while recognition of the technical facts is delayed. Dispersion of the small amount of ash passing the collectors and precipitators is important and the next line of attack must be on the sulphur content of the gases.



## Winds Fashion a Yule 'Tree'

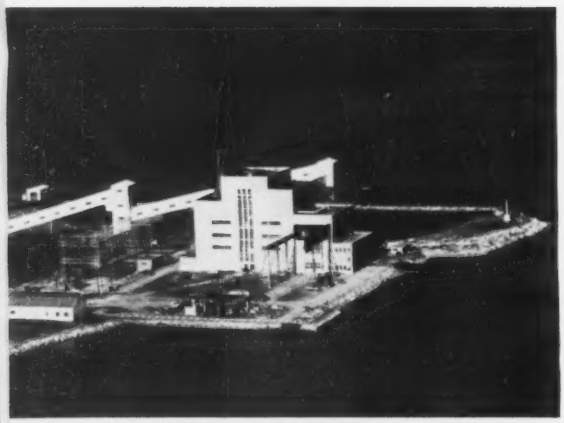
Broken wires dangling from a utility pole were formed into a yuletide pattern when a freak storm hit Chillicothe, Ohio, this month. The storm, which lasted only a few seconds, came without warning, snapping wires and uprooting trees.



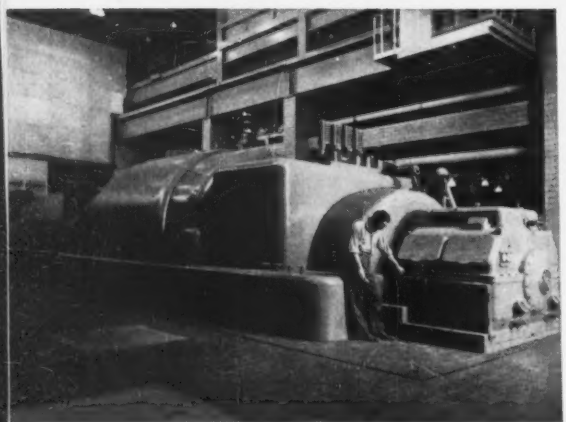
**COMPACT SWITCHYARDS** can be supplied by G.E., even including yard lighting. Here are two of the three 115 KV-3,500,000 KVA oil circuit breakers at Danskammer Point Steam Station.

**ENGINEERING COORDINATION** means simpler installation of major equipment like this 84,000 kva forced-oil-air-cooled transformer. G-E Product Specialists follow selection and installation of equipment.

# G-E Project Service Helps Save Manhours,



**THIS IS DANSKAMMER POINT** Steam Station near Newburgh, N. Y., on the west bank of the Hudson River. G.E. supplied major electrical equipment.



**PRESENT 66,000 KW TURBINE-GENERATOR,** installed under the supervision of G-E field engineers. Second unit is an exact duplicate of this one.

## Engineering coordination, on-time shipments speed construction at Danskammer Point

General Electric Project Service is helping to save time and money for Central Hudson Gas & Electric on their expansion at the Danskammer Point Steam Station. Working closely with Central Hudson and Burns & Roe (engineers and constructors) a General Electric Project Team follows every phase of engineering, manufacturing, and delivery of substantially all the major electrical equipment to be used in the 66,000 kw addition to be completed early in 1954.

A Project Team captained by the G-E sales engineer and consisting of an application engineer, expeditor, and system and product specialists was also following the first unit, built in 1951, to keep delivery, and thus construction, on schedule—reducing costly overtime and conserving engineering talent.

### HERE'S HOW YOU BENEFIT FROM PROJECT SERVICE

Whenever you have a building or expansion program involving major pieces of equipment, Project Service can help you and your consulting engineer. A Project Team will:

**SIMPLIFY ORDERING OF EQUIPMENT,** either purchased directly or through your consulting engineers or machinery manufacturer.

**CONSERVE YOUR ENGINEERING TIME** by handling many important electrical details, relieving you and your consulting engineer.

**COORDINATE EQUIPMENT DESIGN** to insure maximum utilization of equipment, throughout the entire project.

**SPEED CONSTRUCTION** by insuring the arrival of equipment exactly as it is needed for greatest efficiency.

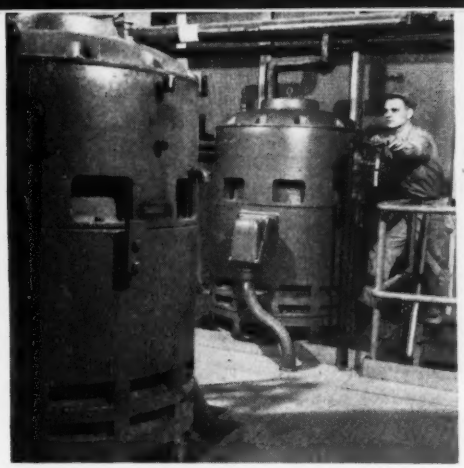
**SUPERVISE INSTALLATION** to insure minimum start-up time and help train operators.

For details on how Project Service can help you, contact your G-E Representative or write for GEA-6032, to Apparatus Sales Div., General Electric Co., Schenectady 5, N. Y. 302-3

*MORE POWER TO AMERICA*

GENERAL ELECTRIC

**G-E 3600 AMP ISOLATED PHASE BUS** and surge protective equipment, well planned in the early stages, goes in fast.



**PROJECT SERVICE INSURES** complete electrical coordination of station auxiliary equipment, such as these 125 hp circulating water pump motors.

**PACKAGED CONTROL CENTERS,** such as this, simplify operation, compactly combine related elements.

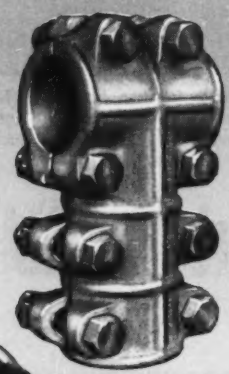
# Cut Costs for Central Hudson Gas & Electric

**PROJECT PROGRESS** on second unit is discussed by C. B. Wilson, G-E Application Eng., Ralph Roe, Pres., Burns & Roe, Engineers and Constructors, W. West, G-E Sales Eng., and R. B. MacGuinness, V. P. of Central Hudson

# DELTA-STAR builds a *Complete Line* of POWER CONNECTORS

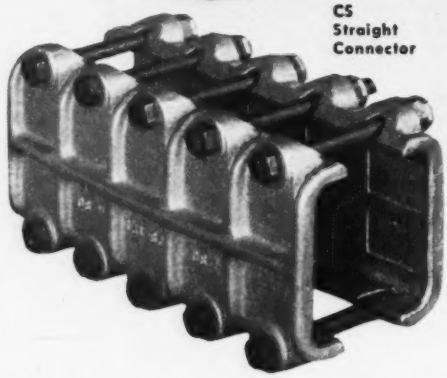
**Whatever your requirements there is a Delta-Star connector designed specifically to do the job. Never is there any necessity of adapting a connector to your particular application. There is available at Delta-Star the exact connector you require in clamp or solder types for copper or aluminum conductors with all the characteristics that have won such general acceptance throughout the industry.**

**Delta-Star clamp type connectors incorporate all three essential requirements of positive electrical and mechanical connection, ease of installation, and continuity of service over long periods of time.**



**FT**
**Clamp Type**
**Connector**

**TU**
**High Compression**
**Connector**



**CS**
**Straight**
**Connector**

**Positive electrical and mechanical connection**— all Delta-Star connectors are cast-to-size in our own foundry and surface strength is left intact by the elimination of machining. Strong gripping action is secured by the retention of a great number of minute projections which dig into the tube or cable as bolts are tightened and help prevent slippage or loosening.

**Ease of installation** — high compression clamp type connectors are designed as a one-piece unit with U-bolts held securely in position by bent-over yoke projections. Other types are designed whenever possible with two halves of like dimensions. Being interchangeable no care need be taken to keep them in pairs.

**Long continuity of service** — Delta-Star connectors are cast from an alloy stronger than copper under rigid foundry control. U-bolts and nuts are of DURONZE, a non-ferrous bolt material with a splendid service record. Edges and ends are rounded to eliminate crystallization or adhesion. No detail, however small, which adds to dependability has been overlooked or neglected.

**NEW CATALOG** now being prepared covers the complete line of Delta-Star Power Connectors: contains Technical Data Section with Tables and Charts pertaining to application of various types. Reserve your copy.

# DELTA-STAR ELECTRIC DIVISION

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2437 FULTON STREET, CHICAGO 12, ILLINOIS
DISTRICT OFFICES IN PRINCIPAL CITIES

**WHEN YOU WANT THE BEST IN HIGH VOLTAGE EQUIPMENT SPECIFY DELTA-STAR**

## Niagara-FPC Case

### Supreme Court puts off decision until next year. Both sides reply to New York brief

Case which could have a significant bearing on the scope of the Federal Power Act and the development of future power at Niagara Falls has been carried over until next year by the Supreme Court.

Arguments pitting Niagara Mohawk Power Corp against the Federal Power Commission were heard by the high court in October (EW, Oct. 26, p 6), and further memoranda on one phase of the case were received later.

**Choices . . .** When it does get down to writing a majority opinion, the court has a variety of choices. It may:

- Resolve the case on the very narrow grounds on which it originally was instituted—either that Niagara Mohawk is or is not allowed to charge off certain expenses for water-use rights under its FPC license for Niagara power plants.
- Side with the lower court which held that state water rights do not evaporate when encompassed in an FPC-licensed project, thus whittling down the alleged paramount authority of FPC to license water power projects on navigable streams.
- Find, as requested by State of New York, that Niagara Mohawk holds no proprietary rights in the water it is using, either through acquisition or under FPC license. New York contended that these rights are held and controlled by the state.

**Memoranda Filed . . .** This last possible finding by the court arises almost entirely from the amicus curiae brief filed by New York just two days before arguments were heard. FPC and Niagara Mohawk were allowed to file memoranda in reply.

In this reply memoranda, the opponents split down the middle on the issues presented by the state.

Niagara Mohawk sided with the state in its argument that the Federal Power Act has not destroyed proprietary rights to the use of waters from navigable streams. But it challenged argument that the water-use rights being exercised by the company actually are held and controlled by the state.

Niagara Mohawk, represented by John W. Davis, argued there was no dispute over the rights during the period (1941-1947) covered by the case. Davis then added, "we wish to make clear that we will vigorously contest an attack by the state on these rights if it is ever properly made in an appropriate forum."

**Future Development . . .** It was clear that both the state and Niagara Mohawk had in mind future power development at Niagara Falls. The state appeared to be trying to gain Supreme Court endorsement of public development of that power. Niagara Mohawk was trying to protect its plan to develop the falls power with four other large New York electric companies.

FPC also took issue with a portion of the New York brief. FPC General Counsel Willard W. Gatchell argued that the Federal Power Act provides for a single agency (FPC) to authorize water power developments on navigable streams. This, he argued, meant that neither New York nor any other state can exercise a veto over this authority by controlling the water-use rights in navigable streams.

As to the New York claim that Niagara Mohawk has no proprietary rights in Niagara waters, FPC said the argument was backed with "a wealth of authority."

## Horan Proposes Corps Build Rocky Reach Dam

Although six Pacific Northwest private power companies got the publicity play with their announced plans at a governors' conference in Seattle to build dams in partnership with the federal government, the Rocky Reach Dam proposed by the Chelan County PUD on the Columbia River near Wenatchee, Wash., may offer the initial opportunity for such a partnership.

The PUD officially has applied to the FPC for permission to study the 585,000-kw project and Rep Walt Horan, the district's Republican representative in Congress, has proposed federal legislation which would authorize the Army Corps of Engineers to plan and build the dam for the PUD.

Horan's proposed legislation would authorize the project, appropriate planning funds, permit the Corps of Engineers to build the dam if the PUD desires and provide for marketing by the Bonneville Power Administration of power not required locally. The PUD would repay the corps for its work, receiving credit for non-power features which would be paid for by the federal government.

## POWER BRIEFS FROM THE NEWS

- Several generating units have been placed in operation throughout the United States during the past month. Oregon-California Power Co has put its new Clearwater No. 2 plant on North Umpqua River into operation, adding 26,000 kw to the system. Commonwealth Edison Co has installed a new 150,000-kw turbo-generator at its Ridgeland plant. Detroit Edison Co has started up a new 150,000-kw steam turbine-generator at its St. Clair power plant, second of four to be placed in operation there. Wisconsin Electric Power Co has turned on the first generating unit at its Giant Oak Creek power plant. This boosts the utility's capacity by 120,000 kw.
- Pennsylvania Electric Co has placed in operation its first 230-kv transmission line and substation. The $2-million substation, at Lewistown, Pa., which has a capacity of 100,000 kva, was energized late last month through a tie with Metropolitan Edison Co, another utility in the General Public Utilities Corp system. Penelec's 230-kv line joins Metropolitan at Montebello, 31 miles southeast of Lewistown.
- Bureau of Reclamation's California Projects has been re-established as Region 2 upon recommendation of the bureau's reorganization survey team. Clyde H. Spencer's title of supervising engineer has been changed to regional director. However, the organization of the California set-up will remain unchanged.
- For the first time since 1932, the street lights of Fifficktown, a community of Croyle township near Johnstown, Pa., have been placed in operation. Fifficktown's 15 families convinced the commissioners that they could afford to pay for 18 lamps. They were originally turned off as an economy move.

## GE Employees . . .

### . . . retain IU as agent in Mass. plants. Firm's anti-Communist policy calls for ouster of Reds

The International Union of Electrical Workers, CIO, has been retained by General Electric Co workers as bargaining agent at the Lynn and Everett, Mass., plants in a National Labor Relations Board election.

IU, which has represented about 12,000 production and maintenance workers for the last four years, received 5,546 votes to 4,806 for the United Electrical Workers, independent, which lost its affiliation with the Congress of Industrial Organizations in 1949. Out of the 13,959 eligible employees, a total of 12,647 voted in the elections.

**Communism Election Issue . . .** Main issue of the campaign was communism. IU charged that the United Electrical Union was expelled from the CIO on charges of communist domination. UE answered that it withdrew from the CIO because of its weak leadership.

The election was held about the time GE announced its tough anti-Communist policy.

General Electric announced it will discharge immediately from its employ all admitted Communists, spies, and saboteurs and will suspend employees who refuse to testify under oath on such matters when questioned in public government hearings.

Ralph J. Cordiner, president of General Electric, urged in a company statement that an independent federal security agency be established to make clearances on applications by suspended employees.

Issuance of the statement followed charges by Senator Joseph R. McCarthy that GE plants had been infiltrated by Communists. In commenting on GE's policy, Sen McCarthy said the company should be commended for its "fine" new policy. The Republican of Wisconsin, chairman of the Senate Permanent Subcommittee on Investigations, recently held private and public hearings in Boston on communism in General Electric's Massachusetts plants.

## Anderson Adds Connector-Lug Series

Anderson Brass Works, Inc, Birmingham, Ala., has given the name "Dura Lug" to its new series of cast lugs. Several sizes of the new series of bronze terminal connectors are being inspected by Anderson's President R. E. Schuler (seated), R. L. Lock (left), chief engineer, and J. L. Howarth, general sales manager.

The new Anderson "Dura Lug," which requires no special tools for installation, is a high-conductivity bronze lug with a separate eye socket casting of high tensile bronze alloy. The connectors are available in 11 different cable ranges from No. 14 through 2,000 MCM. Anderson reports the new addition is the only lug of its type which passes the mercurous nitrate test.

## Surplus Alumina Plant to Be Bought by Harvey

After a year of negotiation over terms, Harvey Machine Co, Torrance, Calif., has agreed to buy the war-built surplus alumina from clay experimental plant at Salem, Ore., from the government for $325,000.

The sale was held up because Harvey objected to government demands that experiments on alumina from Oregon clays be subject to federal approval, according to an informed source. Under the final terms, Harvey agrees to continue the experiments, but their nature, extent, and duration will be up to the company.

Harvey expects to use domestic clays in spite of their low yield, rather than pay the high transportation costs for foreign bauxite.

The process, as yet unannounced, will take a year or two to prove out in production. Harvey has been doing research for four years, and during that time has assembled a staff which is taking over the Salem plant. Arch W. Metzger, who has been associated with the plant since its building in 1944-45, continues as plant manager for Harvey.

## MANUFACTURING BRIEFS

**H. K. Porter Co, Inc,** Pittsburgh, has acquired the Alloy Metal Wire Co, Prospect Park, Pa., which produces stainless and alloy steel wire, rod and strip for use in the electrical, electronic, and chemical fields. Opera-

tions will continue as the Alloy Metal Wire Co, a division of the Porter company.

**Chilean copper** has been sold to United States consumers at 30¢ a lb. This marks the first time in more than five months that Chilean copper has been sold here.

**Production of primary aluminum** in the United States during October totaled 216,438,214 lb, the Aluminum Association has reported. October's output is below September's production of 218,666,531 lb.

**Wagner Electric Corp** has purchased from Fulton Iron Works Co a five-acre improved tract adjacent to its present property in St. Louis. The tract contains five mill-type buildings, aggregating 125,000 sq ft of floor space. The Fulton company, however, will continue to occupy the premises for one year.

## SALES ASSIGNMENTS

### COMPANY STAFFS

**Remington Corp** has appointed Louis F. White and Fred A. Weber as district sales managers for its Air Conditioning Division. White, who came to Remington from Avco Manufacturing Corp's Crosley Division, will represent Remington room air conditioner sales in six New England states and in the Albany-Troy, New York, trading area. Weber, who was associated with E. B. Latham Co, New York, before joining Remington, will be in charge of the Metropolitan New York trading area and New Jersey.

**General Electric Co's** Richmond (Va.) Apparatus Sales Office has named W. P. Molette, Jr, manager of electric utility sales. Molette, who began with GE in 1928, has handled since 1937 central station sales both in Charlottesville and Richmond.

**Dravo Corp,** Pittsburgh, Pa., has announced that Jack T. Mason, Jr, will supervise the Washington office which has been moved to 48 Court St., Ellicott City, Md.

**Elliott Co,** Jeannette, Pa., has made F. Q. Wilson New York district manager with headquarters at New York City. Wilson, who joined the company in 1938, became district manager of the Cincinnati, Ohio, office in 1947.

### REPRESENTATIVES

**Standard Transformer Co,** Warren, Ohio, has appointed H. W. Petty, 696 Florida Ave., Pittsburgh, as its sales representative for the western part of Pennsylvania.

## Winners of Sylvania TV Awards

Jack Webb, Mary Martin, and Donald O'Connor (left to right) are shown with prizes presented to them by Sylvania Electric Products, Inc, for winning 1953 Television Awards.

Webb's show, "Dragnet," won approval for presenting the law enforcement officer in his proper light. Mary Martin's individual pantomime fashion satire on the Ford 50th Anniversary Show was responsible for her award. O'Connor's versatility earned him the title of outstanding variety performer.

## MEETINGS CALENDAR

**National Rural Electric Cooperative Association**
Annual Convention, Dinner Key Auditorium, Miami, Fla., Jan. 11-14.

***Public Information Program**
Mid-Atlantic Region Meeting, Atlantic City, N. J., Jan. 15; West North Central Region Meeting, Madison, Wis., Feb. 5.

**Edison Electric Institute**
Accident Prevention Committee, Hotel Statler, Boston, Jan. 18-19; Industrial Relations Committee, Joint Meeting with Personnel Administration Section, Southeastern Electric Exchange and Southwestern Personnel Group, Hotel Roosevelt, New Orleans, La., Jan. 21-22; EEI-AGA Taxation Accounting Committee, Arlington Hotel, Hot Springs, Ark., Jan. 27-29; Transmission and Distribution Committee, Hotel Cleveland, Cleveland, Ohio, Feb. 9-10; Electrical Equipment Committee, Sheraton Cadillac Hotel, Detroit, Mich., Feb. 15-16; Industrial Relations Committee, EEI Headquarters, New York, March 18; Sales Meeting, Edgewater Beach Hotel, Chicago, April 5-8; EEI-AGA Accounting Conference, Hotel Statler, Boston, April 12-14; Industrial Relations Committee, Netherlands Plaza Hotel, Cincinnati, Ohio, April 15; Annual Meeting, Atlantic City, N. J., June 1-4.

**American Institute of Electrical Engineers**
Winter General Meeting, Statler Hotel, New York, Jan. 18-22; Conference on Feedback Control, Claridge Hotel, Atlantic City, N. J., April 22-23; Northeastern District Meeting, Schenectady, N. Y., May 5-7; Summer General and Pacific General Meeting, Hotel Biltmore, Los Angeles, June 21-25; Conference on Telemetering, Morrison Hotel, Chicago, May 24-26.

***New England Meter Engineers**
Hotel Somerset, Boston, Jan. 21-22; Demand Register School, New England Power Bldg., Boston, Feb. 8-13.

**Electrical Equipment Representatives Association**
Winter Annual Meeting, Biltmore Hotel, Los Angeles, Feb. 8-11.

**National Association of Purchasing Agents**
Mid-Winter Conference, Public Utility Buyers' Group, Lord Baltimore Hotel, Baltimore, Md., Feb. 15-16.

***Pennsylvania Electric Association**
Winter Meeting, Transmission-Distribution Committee, Lord Baltimore Hotel, Baltimore, Feb. 11-12; Winter Meeting, Relay Committee, Benjamin Franklin Hotel, Philadelphia, March 4-5.

**National Electrical Manufacturers Association**
Spring Meeting, Edgewater Beach Hotel, Chicago, March 8-11.

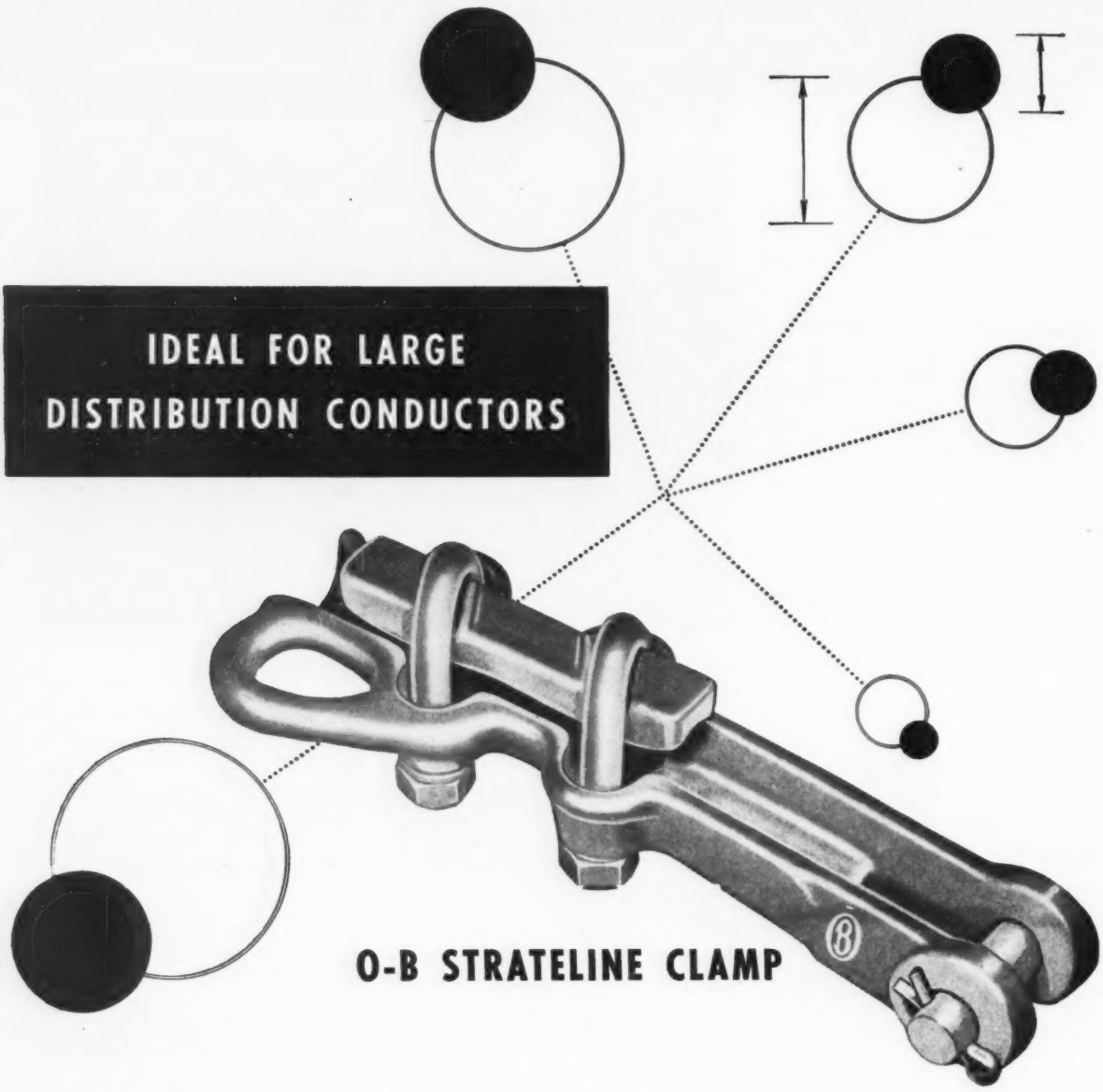
***Southeastern Electric Exchange**
21st Annual Meeting, Boca Raton Hotel, Boca Raton, Fla., March 22-24; Spring Meeting, Engineering and Operation Section, Sans Souci Hotel, Miami Beach, Fla., May 6-7.

**American Power Conference**
Sherman Hotel, Chicago, March 24-26.

**American Society of Mechanical Engineers**
Semi-Annual Meeting, William Penn Hotel, Pittsburgh, June 20-24.

*Addition this week.

# IDEAL FOR LARGE DISTRIBUTION CONDUCTORS



## O-B STRATELINE CLAMP

Here's an inexpensive and highly effective deadend clamp for aluminum primary distribution conductors, especially in the larger diameters. Only five stock sizes of the O-B Strateline clamp will accommodate cable sizes from 0.15 to 1.55 inches--offering a still further economy in stockroom inventory. Holding strength and safety factors are generous for distribution service. Size and shape adapt the clamp ideally to restricted phase clearances, and facilitate the application of protective shields for hot line work. The entire Strateline group is duplicated in malleable iron, aluminum, or bronze to offer a free choice of cable-matching combinations.

Consisting of a re-design of a long-used O-B item, the modernized Strateline clamp offers the added advantage of long, successful service experience.

For extended range of cable diameters, ideal adaptation to distribution requirements, full choice of body metal, and attractive low cost, specify O-B Strateline clamps for your primary line construction.

Ohio Brass

MANSFIELD OHIO, U.S.A.

*IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

4387-H

# Maine Utility Gets Rate Hike

## PUC grants Central Maine Power a $1,422,000-a-year electric increase as compared with $3,284,389 requested

The Maine Public Utilities Commission has granted an electric increase of $1,422,000 a year on an application submitted by Central Maine Power Co requesting additional revenues of $3,284,389.

**Fair Value . . .** In its discussion of the rate base the PUC laid considerable emphasis on the change of the Maine law with respect to "fair value" and agreed with the company's contention that the new law was applicable to the company's petition at this time. It went on to say:

"Assuming that the new law applies, the commission shall give consideration to original cost, prudent acquisition cost, current value, all less depreciation, and any other material and relevant factors."

The commission, in arriving at the net original cost of the property, considered several possible electric operating book figures presented by the company. These varied from a minimum of $129.5 million for the average 12 months ended Dec. 31, 1953 to $137.8 million for an estimated average 12 months ended Dec. 31, 1953. The commission said:

"Considering that the company's properties are expanding, but not to the extent as indicated in the company's 1953 estimate, we find from the latest available actual book figures that $135 million represents a fair estimate of what the net operating properties will average on the books of the company for the year 1953, under the company's present method of allocation and distribution of accounts."

**Net Original Cost . . .** The commission went on at some length in its analysis of the adjustments which had to be applied to the above figure of net operating property in arriving at the net original cost. It considered, among other things, plant acquisition adjustments in the amount of $2,551,530 which the commission said:

". . . pertains to 23 acquired companies, most of which relates to purchases during the period of 1910 to 1914. The original property was constructed from 40 to 50 years ago and the major parts thereof have been replaced."

It then went on to say:

"In this instance where the property connected with this acquisition amount has been substantially retired, we can give very little consideration to such amount in the rate base."

**Conclusion . . .** In concluding its findings on the original cost of the property, the commission went on to say:

"There was presented by the state, substantial evidence that there is about $8.2 million of property presently listed on the company's books which is open to considerable doubt as to the propriety of its inclusion in original cost of operating property in service. We do not feel sufficient information is presently at hand to adopt the state's evidence in toto. But considering all the above factors and the evidence of both sides as to the original cost of the present properties when first devoted to public use, we find that a total of about $4.5 million in addition to the present E-371 account, should be deducted from the company's book figures to arrive at original cost. In short, the original cost of the properties, in our best estimate, is about $128 million."

**Fair Value Testimony . . .** As to the fair value testimony of the company's expert witness, the commission said:

"This exhibit was largely an attempt to find reproduction cost figures on much of the company's properties, although in the hydro stations he largely discarded reproduction figures and used figures based on the method of comparing an alternate source of supply. Whether the legislature in the new statute by the use of 'current value less depreciation' meant the same as 'current cost less depreciation' is a matter on which we have no precedent. Actually, the witness himself acknowledged his exhibit did not represent reproduction cost less depreciation, but his final conclusion was arrived at partly through reproduction cost, partly through original cost, partly through book cost, partly through steam cost, and partly through various other methods."

It went on to say:

"We cannot subscribe to the conclusion that the properties of the company could not be reproduced in mass at less cost than in piecemeal, and the general experience in the business world is to the contrary. His method of evaluating the hydro facilities of the company on what costs would be for equivalent steam plants, discounts sharply this state's acknowledged natural water resources and leaves the public to absorb the extra costs entailed by expensive transportation of oil and total use of steam."

". . . Altogether, we feel that the witness, with his exhibit, has not produced a total figure which is satisfactory evidence of the current value required by the statute."

**High Price Era . . .** The PUC did, however, agree that since this was an era of high prices, the current value of the company's property was higher than original cost. It concluded by saying:

"Considering the evidence presented by the company of current value, and the evidence of original cost and prudent acquisition cost, and other factors offered to us, we find that the reasonable value of the property used or required to be used in its service to the public is $123 million."

It is noted that this fair value rate base is 3% more than the net original cost previously determined.

As to working capital, the commission disallowed the company's proposed amount of $3.8 million entirely by stating that the monthly balance in tax accruals was in excess of $4 million and must be credited against working capital needs. PUC said:

"Also included in the company's estimate of working capital needs is a substantial item for materials and supplies, yet much of this is for new construction. We believe that no separate additional sum for working capital is required."

As to the overall adjustments which the commission made to the revenues and expenses which the company offered in its exhibits the overall effect was to increase net electric operating income some 9% over the company's net income for the year ended June, 1953, and some 6.1% over the estimated calendar year 1953.

**Rate of Return . . .** As to the rate of return, two consultants testified. One for the company and another for a group of industrial concerns opposing the company's petition. PUC said:

"The company's witness testified: 'It is my opinion and conclusion that the relative criteria of reasonableness and the specific objective studies that I have made indicate a rate of return of 6.1% as being fair and reasonable, but only if applied to a fair value rate base.' (Record, p. 298). He further developed data on various bases and adjusted his return to 6.9% when applied to net book cost.

"The second expert introduced by a group of industrial concerns opposing the petition testified as follows: 'I recommend that a rate of return between 5.5% and 5.8% would be a fair rate if applied to a rate base substantially equal to net original cost and that a lower rate would be applicable if a current value rate base were used.' (Record p. 1163)"

The commission concluded:

"We note the diverse opinions presented by the two consultants as to rate of return on various bases. We note the continuous expansion of the company and its needs for additional financing in the immediate future. We note the present levels of the company's costs and rates. Considering all the evidence before us, including various bases of property value, we find that under these present circumstances a rate of return of 5.9% is just and reasonable on a rate base of $132 million. This will result in a fair return to the company of $7.8 million. We have above determined that the net income, or return, under the present rates is $7,420,000. Revised rates are, therefore, necessary to produce an additional net income of $380,000, or gross additional revenues before taxes of $750,000."

It is important to note, however, that in the Supplemental Decree No. 2 the commission reversed itself on the position that it took with respect to the adjustment of federal income taxes during 1954. In its original order the commission anticipated the tax decrease in 1954 from 52% to 47% and the consequent increase in electric operating income of $300,000. However, in its supplemental decree the commission said:

"We believe that under these circumstances it will be fair to all concerned, to add a surcharge to the rates affected by Supplemental Decree No. 1, sufficient to compensate for the additional burden of the 52% corporate tax, until the 1954 tax rate is finally determined. Such a surcharge required additional revenue of approximately $56,000 a month, or an addition of 2.7% to such rates."

# Today in Utility Finance

## YIELDS (%)

| Quality | Bonds | | | Preferred Stocks | | | Common Stocks | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1st | 2nd | 3rd | 1st | 2nd | 3rd | 1st | 2nd | 3rd |
| DATE | | | | | | | | | |
| 1953 | | | | | | | | | |
| **Dec. 10** | **3.09** | **3.14** | **3.34** | **4.19** | **4.39** | **4.64** | **5.10** | **5.53** | **5.64** |
| Dec. 3 | 3.11 | 3.17 | 3.38 | 4.19 | 4.37 | 4.65 | 5.13 | 5.54 | 5.68 |
| END OF QTR. | | | | | | | | | |
| 3rd 1953 | 3.30 | 3.33 | 3.54 | 4.35 | 4.52 | 4.83 | 5.36 | 5.97 | 6.01 |
| 2nd 1953 | 3.34 | 3.46 | 3.64 | 4.47 | 4.70 | 4.88 | 5.52 | 5.93 | 6.10 |
| 1st 1953 | 3.15 | 3.23 | 3.39 | 4.16 | 4.41 | 4.66 | 4.95 | 5.24 | 5.50 |
| 4th 1952 | 2.99 | 3.03 | 3.15 | 4.06 | 4.22 | 4.59 | 4.98 | 5.38 | 5.62 |

Data: Reis & Chandler, Inc.

## EARNINGS

| Company | Period Months | Ended | Net Income 1953 | Net Income 1952 | Earnings Per Common Share 1953 | Earnings Per Common Share 1952 |
|---|---|---|---|---|---|---|
| Houston Lighting & Power | 12 | Oct. | $10,281,953 | $8,548,224 | $.... | $.... |
| Montana Power Co, consolidated | 12 | Oct. | 7,688,146 | 7,704,350 | 2.71 | 2.72 |
| Pacific Gas & Electric | 12 | Sept. | 58,305,549 | 44,706,778 | 3.12(a) | 2.49(a) |
| Puget Sound Power & Light | 12 | Sept. | 3,702,404 | 3,517,061 | .... | .... |

Note—(a) Based on the average number of shares outstanding in the respective periods.

## FINANCING

| Company and Description | Amount of Offering (000) | Offering Price | Yield to Public |
|---|---|---|---|
| WEEK OF DECEMBER 10-16 | | | |
| **Bonds** | | | |
| Philadelphia Electric—1st mtg 3¼% due 1983 | $20,000 | 99.517% | 3.15% |
| **Preferred Stock** | | | |
| Narragansett Electric—150,000 sh 4.64% $50 par | $7,500 | $51.125 | 4.538% |
| SCHEDULE FOR DECEMBER—JANUARY | | | |
| **Bonds** | | | |
| Salt River Project, Ariz., Agriculture & Improvement & Power District—electric revenues | $5,000 | ..... | Dec. 17 |
| Consolidated Edison Co of New York—1st mtg due 1984 | 35,000 | ..... | Jan. 6 |
| Appalachian Electric Power—1st mtg due 1984 | 20,000 | ..... | Jan. 11 |
| Public Service Co of Indiana—1st mtg due 1984 | 25,000 | ..... | Jan. 12 |
| Ohio Edison—1st mtg due 1984 | 30,000 | ..... | Jan. 19 |
| Central Illinois Electric & Gas—1st mtg | 4,000 | ..... | ..... |
| **Debentures** | | | |
| Detroit Edison—debs 3¾% due 1969 (to be offered commonholders on the basis of $100 principal amount of debs for every 25 shares of common held, record Jan. 6 to expire Feb. 1) | $43,358 | $100.00 | 3.25% |
| **Preferred Stock** | | | |
| Central Illinois Electric & Gas—15,000 sh $100 par | $1,500 | ..... | .....(a) |
| Kansas City Power & Light—70,000 shs | ..... | ..... | ..... |
| **Common Stock** | | | |
| Consumers Power—679,436 sh (to be offered commonholders on a 1-for-10 basis, record Jan. 7 to expire Jan. 22; employees will be given right to unsubscribed shares) | $ ..... | ..... | ..... |
| Ohio Edison—527,830 sh (to be offered commonholders on 1-for-10 basis, record Jan. 14 to expire Jan. 29 with an oversubscription privilege) | ..... | ..... | ..... |
| Kansas City Power & Light—225,460 sh | ..... | ..... | ..... |
| POSTPONED, UNSCHEDULED, AND/OR UNDER CONSIDERATION | | | |
| **Bonds** | | | |
| Southwestern Public Service—1st mtg | $12,000(e) | ..... | ..... |
| Houston Lighting & Power—1st mtg | 25,000 | ..... | ..... |
| Public Service Co of Colorado—1st mtg | 15,000 | ..... | ..... |
| Brazos River Authority, Tex.—electric revenues | 66,000 | ..... | ..... |
| Essex County Electric—1st mtg | 4,000 | ..... | ..... |
| Utah Power & Light—1st mtg | 16,000(e) | ..... | ..... |

Notes—(a) To be offered by a group headed by Stone & Webster Securities Corp during the week of Jan. 4; and (e) Estimated.

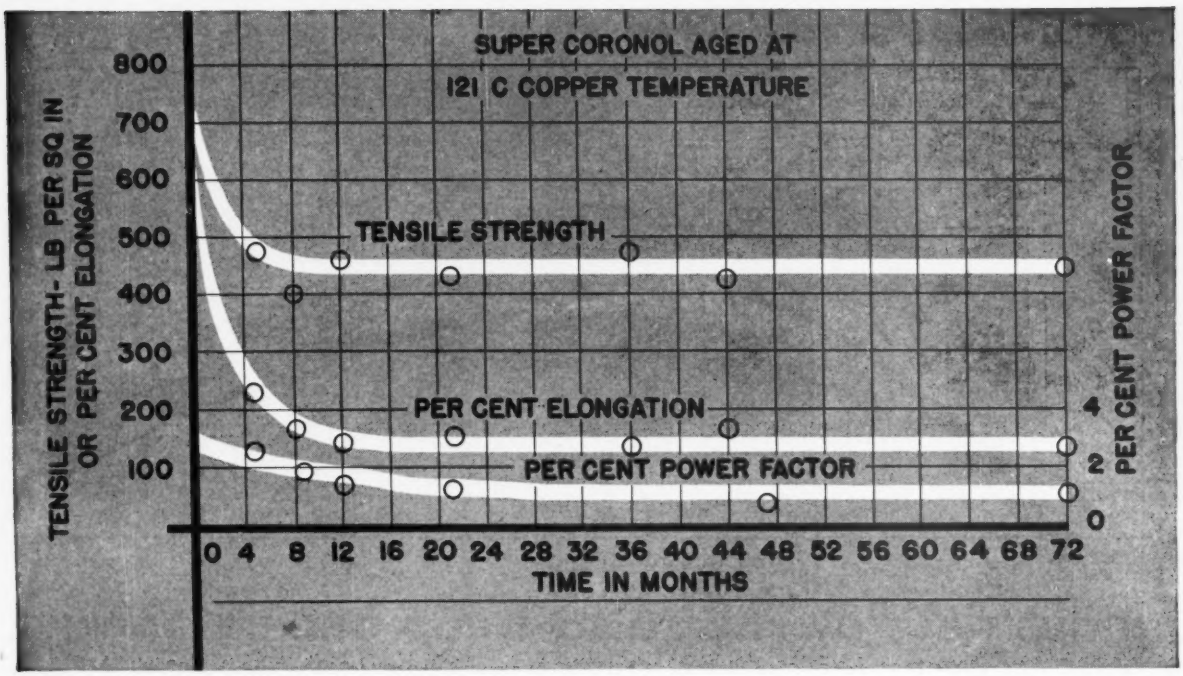



Fig. I: Physical and electrical properties of G-E Super Coronol cable as demonstrated by long-time tests at 121 C copper temperature.

# Greater service-life expectancy from General Electric Super Coronol cable

**Aging tests at 121 C give results equal to 72 years test-life at operating temperature**

General Electric Super Coronol* cable has been tested under load for six years at a continuous copper temperature of 121 C. Both physical and electrical properties have been stable since the 20th month. (See Fig. I.) Following the general rule that insulation life is doubled for every 8 to 10 C decrease in temperature, these data at 121 C indicate from *72 to 135 years of test-life* at the rated temperature of 85 C.

These tests, supplemented by many others, demonstrate the justification for basing the ratings of all G-E Super Coronol power cables, for service up to and including 8000 volts, on a permissible maximum copper temperature of 85 C, and for permitting emergency overload temperatures. (See Fig. II.) Super Coronol cables are available as single-conductor cables (shielded and unshielded), preassembled aerial cables, submarine cables, and power cables. For further information on Super Coronol cables and other General Electric wire and cable products and systems, consult your G-E cable specialist, or write Section W113-1227, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.

**Fig. II: Allowable Operating Temperatures Super Coronol-Geoprene Cable**

| Voltage Rating | Normal Loading | Emergency Overloading | Short Circuit Loading |
|---|---|---|---|
| 0-1000 | 85 C | 115 C | 150 C |
| 1001-5000 | 85 C | 102 C | 145 C |
| 5001-8000 | 85 C | 100 C | 140 C |
| 8001-15000 | 80 C | 90 C | 120 C |

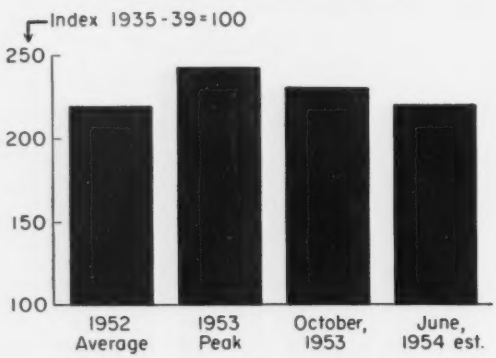
*Registered Trade-mark General Electric Company

*You can put your confidence in—*

**GENERAL ELECTRIC**

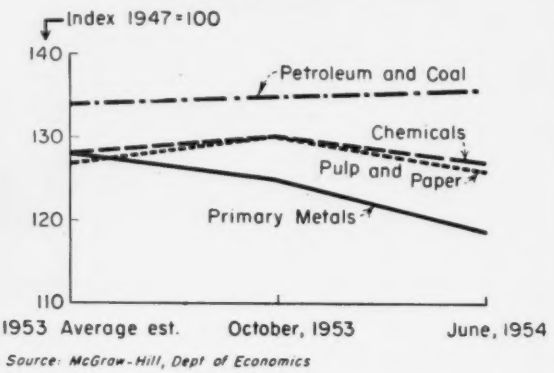
# ELECTRICAL BUSINESS OUTLOOK

**The Outlook for Total Production...**




Source: Federal Reserve Board, June, 1954 estimated by McGraw-Hill, Dept of Economics

**...And Some Big Power Consumers**




Source: McGraw-Hill, Dept of Economics

# Industrial Power Use to Keep Sliding Slowly

Industrial power use is expected to fall in the next six months. The trend in industrial production—and therefore in power consumption—is still downward, as it has been since early this year. Industrial production has dropped about 6% from the peak set last March. That's just about what was expected (EBO, June 8). The decline has been fairly slow and steady—not sharp, as in a marked recession. The same sort of decline—reasonably slow and orderly—seems in prospect between now and next June.

This prospect is in line with the general appearance of the business picture. The superboom of the past year seems to be wearing out (EBO, September 14). The trend of government spending plans, business plants for new investment, and consumer buying intentions, all point to some decline in activity. And the high level of business inventories is another argument for a drop in production. Industries with large inventories quit buying until they are reduced.

**Autos Are Key to Industrial Production . . .** Barring new threats of war (or new promises of peace), the automobile industry may be the most important factor in changing the course of industrial production between now and next June. The huge auto industry was a major factor in the boom of the past year. And recent cutbacks in auto production have contributed to lowering business activity in other parts of the economy.

The big question for early 1954 is: How will the auto people schedule their production? They can start the year producing at a very high level and hope that autos sell in large volume. Or they can start slowly and increase production to keep up with demand.

Until recently, the auto people seemed to be planning a fast start for 1954. News from Detroit indicated that about 3 million cars would be produced in the first half of next year—nearly as many as in 1953. Such a level of production would also mean very high levels for all the other industries that supply autos, like steel, glass, and rubber.

But now there's talk that the industry is getting cautious—that it may be cutting back its early production plans, waiting to see how the new cars sell in the consumer markets. This could make the drop in production in other industries more severe than expected. On the other hand, a very fast start might prevent any important decline in overall industrial production for several months.

The outlook for a slow slide in industrial production assumes that Detroit will produce at a fairly high level through most of early 1954. In that case, the Federal Reserve Board's industrial production index may drop to about 220 (1935-39 equals 100) by next June. Today the index is around 228, down from its peak of 243 last March.

**Outlook For Big Power Users Varies . . .** The outlook for important power consuming industries varies considerably. (See second chart). The chemical industries have been producing at high levels through most of this year. But they are beginning to run into problems—chiefly declining demand from two key customers, the farmers and the textile manufacturers. Consequently, chemical production is likely to be off by 2%-3% in the early part of 1954.

Primary metals producers—especially steel—will be heavily influenced by auto production. But even if this is high, they can expect somewhat lower total demand for their products in the next few months as a result of lower production of other consumer durables and reduction in industry's metals inventories.

Paper and pulp makers will probably cut back, too. Inventories of paper and pulp products are big. The same is true of textiles (not charted). On the other hand, output of petroleum and coal products may rise a little.

The section of Duraline has been photographed with covering unsaturated to show construction.

# SERVICE DEPENDABILITY

## Duraline, like a rosebud, keeps moisture out

Duraline's unique construction — an exclusive continuous interlocked fibrous sheath, thoroughly impregnated with URC saturants, then covered with URC finishers—provides finest weatherproof performance and service dependability. Won't festoon, stays right there on the job. Provides added protection against contact with foreign objects.

Duraline* is your best insurance against bad weather. Only Anaconda makes a line wire like this. Available with copper, Copperweld or aluminum conductors. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.* 53326

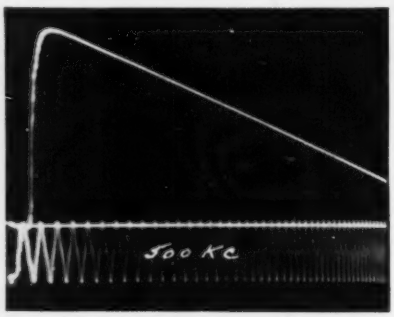
*Reg. U. S. Pat. Off.

**ANACONDA®**

*service and overhead distribution cables, both bare and weatherproof, including ACSR • signal, control and communication wire • portable cords and cables • network cables • airport and street lighting cables • mine cables • magnet wire • copper, aluminum, and copperweld conductors • wire and cable accessories,*

# SUBTRACTING AIR
# Adds Strength

**Proof of Performance for *Every* Standard Distribution Transformer**




**You know you get all the inherent insulation strength possible in an Allis-Chalmers distribution transformer. The oscillogram above — taken from a production line impulse test — proves it. It shows that all the production processes necessary to extend transformer life have been carried out. Not only distribution transformers with protective equipment, but conventional units are tested as well. This is Allis-Chalmers seventh year of production line impulse testing.**

**Every Allis-Chalmers distribution transformer** gets a fast, efficient vacuum treatment to remove air bubbles in windings and oil. The process also assures complete oil impregnation of all fibrous insulation before the transformer leaves the factory.

### How the Vacuum Process Works

The photo above shows the operation. While the core and coil unit is still hot from the dry-out oven, it is tanked and covered with hot oil. Then, immediately after final assembly, the vacuum draws out all moisture and any air bubbles locked within the transformer windings.

### Many Steps Improve Transformers

This is just one of the many careful steps in design and manufacture that bring you dependable Allis-Chalmers distribution transformers. It means you can count on more transformer service years . . . more economy in transformer operating costs.

For further information call your nearby A-C district office or write Allis-Chalmers, Milwaukee 1, Wisconsin.

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